Bids received until July 12, 1915.

County Highway Tunnel

OFFICE OF THE CONTROLLER OF ALLEGHENY COUNTY.
Pittsburgh, Pa., June 1st, 1915.

Sealed proposals will be received at this office until 1:30 o'clock P.M., Monday, July 12th, 1915, and will at that time be publicly opened by the County Commissioners, for the construction of a tunnel and the approaches thereto, known as "County Highway Tunnel No. 1," extending from the southerly side of East Carson Street near Third Street, Pittsburgh, in a southerly direction to a point on Warrington Avenue, near Boggs Avenue, Pittsburgh, Pa. The proposals submitted must be on the blank form of proposals which are bound with the contract, specifications and information for bidders, and must be addressed to the County Commissioners of Allegheny County, Pennsylvania, and deposited with the County Controller, marked "Proposal for County Highway Tunnel No. 1." Proposals must be accompanied by a certified check in the sum of One Hundred Fifty Thousand ($150,000.00) Dollars, made payable to the Commissioners of Allegheny County, to be returned to the unsuccessful bidders three days after the awarding of the contract. Within ten (10) days after receiving final notice of the awarding of the contract, the successful bidder will be required to execute the contract and furnish a proper surety bond, satisfactory to and to be approved by the County Commissioners, in the sum of Fifty (50%) per centum of the amount of the contract price, conditioned for the faithful performance of all the terms and provisions of the contract.

Copies of the form of proposal, contract and information for bidders and copies of the plans and specifications may be obtained at the office of A. D. Neeld, Consulting Engineer for the County of Allegheny, at No. 237 Fourth Avenue, Pittsburgh, and at the office of the County Commissioners, Court House, Pittsburgh, Pa., on and after June 7th, 1915. Those desiring to bid may have plans and specifications upon the deposit of Twenty-five ($25.00) Dollars, which will be refunded if said plans and specifications are returned in good condition within ten (10) days after the bids have been received and acted upon by the County Commissioners.

The County Commissioners reserve the right to reject any and all bids.

HYATT M. CRIBBS,
County Controller for the County of Allegheny.

Bids received until July 7, 1915.

Street Improvement

Cumberland, Md.

Sealed proposals addressed to the Mayor and City Council of Cumberland, Maryland, endorsed "Proposal for regrading, recurbing, repaving and otherwise improving Baltimore Street," will be received at the Office of the City Clerk, City Hall, on or before 9:30 A.M. Wednesday, July 7th, 1915.

Approximately about six (6) thousand square yards of Creosoted Wood Block pavement required.

Plans and Specifications can be procured at Office of City Engineer, for which a deposit of ten dollars will be required, which will be refunded on return of Plans in good order.

Each Bid must be accompanied with a Certified Check for One hundred dollars, payable to the order of the Mayor and City Council of Cumberland, Md.

JAMES P. GAFFNEY, City Engineer.

Bids received until June 29, 1915.

Sewer Construction

Columbus, Ohio.

Bids will be received by Geo. A. Borden, Director of Public Service, until 12 o'clock noon, Central Time, Tuesday, June 29, 1915, for construction of

South Side Storm Sewer

Sizes 123" to 12"; approximately 5 miles; about 400 feet in tunnel; average cuts from 7 to 17 feet; estimated cost $250,000.00.

Maryland Avenue Storm Sewer

Sizes 84" to 30"; approximately 1.6 miles, average cuts from 6 to 16 feet; estimated cost $100,000.

Plans and specifications from Henry Maetzel, Chief Engineer, City Hall; $5.00 deposit.

Bids received until July 13 and 15, 1915.

Highway Work

OFFICE OF THE STATE COMMISSION OF HIGHWAYS.
Albany, N. Y.

Sealed proposals will be received by the undersigned at their office, No. 55 Lancaster Street, Albany, N. Y., at 1 o'clock p.m. on Tuesday, July 13th, 1915, for the improvement of highways in the following counties and also for the following repair contracts:

Broome (approx. 3.15); Chenango (2 highways 7.78; 4.02); Jefferson (2 highways 2.86; 2.40); Lewis (3 highways 2.00; 8.82; 1.27); Montgomery (approx. length 7.10); St. Lawrence (approx. length 5.50); Schoharie (approx. length 4.79); Schuyler (two highways 6.03; 1.11); Steuben (3 highways 9.09, 3.42, 7.31); Sullivan (approx. length 0.72); Tompkins (approx. 3.04); Westchester (approx. length 4.32); Wyoming (2 highways 1.53; 6.99); Delaware, 1 contract (resurfacing); Ontario, 1 contract (resurfacing); Suffolk, 1 contract (resurfacing).

Sealed proposals will also be received by the undersigned at their office, No. 55 Lancaster Streeet, Albany, N. Y., at 1 o'clock p.m. on Thursday, July 15th, 1915, for the construction and repair of highways in the following counties:

Broome, 1 highway (approx. length 0.91); 1 contract (resurfacing); Cattaraugus (approx. length 0.93); Chautauqua, 4 highways (1.51; 0.77; 3.55; 0.93); Cortland (approx. length 0.23); Erie, 2 highways (0.34; 0.59); Fulton (approx. length 2.12); Monroe, 1 highway (approx. length 1.53); 3 contracts (resurfacing); Montgomery (approx. length 3.81); Nassau (approx. length 1.57); Onondaga (approx. length 0.27); Ontario (approx. length 1.38); Otsego, 2 highways (12.66; 2.52); Rockland (approx. length 2.95); Suffolk (approx. length 3.25); Ulster (approx. length 2.97); Warren (approx. length 5.13); Steuben County (1 highway, approx. length 1.72 miles).

Maps, plans, specifications and estimates may be seen and proposal forms obtained at the office of the Commission in Albany, N. Y., and also at the offices of the Division Engineers in whose divisions the roads are to be constructed or repaired. The addresses of the Division Engineers and the counties in which they are in charge will be furnished on request.

The especial attention of bidders is called to "Information for Bidders" in the itemized proposal, specifications and contract agreement.

EDWIN DUFFEY, Commissioner.
IRVING J. MORRIS, Secretary.

Bids received until July 14, 1915.

Bids on $65,000 Sewer Bonds

Imperial, Calif.

Notice is hereby given that sealed bids will be received by the undersigned at the City Hall, City of Imperial, County of Imperial, State of California, up to the hour of 8 o'clock P.M. of Wednesday, the 14th day of July, 1915, for the purchase of $65,000.00 issue of sewer bonds of the said City of Imperial, California. Bonds bear six per cent. interest, and will be issued to run not longer than 40 years, in denominations to suit purchaser, not less than $1600.00 of said bonds to be payable each year.

Bonds will be sold to the highest and best bidder and the Board reserves the right to reject any and all bids and to readvertise.

Bonds subject to approval of attorney for purchaser.

Dated, Imperial, Cal., June 11, 1915.

LELIA FOSTER, City Clerk, City of Imperial.

Bids received until June 29, 1915.

Street Paving

Meriden, Conn.

Sealed Proposals addressed to The Board of Public Works of the City of Meriden and endorsed "Proposals for Street Paving" will be received by said Board until 8 o'clock P.M., Tuesday, June 29th, 1915, for constructing Wood Block, Vitrified Brick and Reinforced Concrete Pavements on East and West Main Streets in said City. Plans and Specifications may be obtained upon personal application at the City Engineer's Office, Town Hall Building, Meriden, Conn., where all wishing to bid must procure them.

The Board of Public Works expressly reserve the right to reject any or all bids as it deems best for the interests of the City of Meriden so to do.

Bids received until June 29, 1915.

Power House Improvements

Middletown, N. Y.

Sealed proposals for additions and alterations to Power House for Power House Equipment, construction, heating, plumbing and electric work at the Middletown State Homeopathic Hospital, Middletown, N. Y., will be received by the State Hospital Commission, Capitol, Albany, N. Y., until 2:30 o'clock P.M. on Tuesday, June 29, 1915, when they will be publicly opened and read. Proposals shall be enclosed in an envelope furnished by the State Architect, sealed and addressed, and shall be accompanied by a certified check in the following amounts: For construction work, $250.00; heating work, $4,500.00; plumbing work, $100.00; electric work, $175.00. The contractors to whom the awards are made will be required to furnish surety company bond in the sum of fifty (50%) per cent. of the amount of contract within thirty (30) days after official notice of award of contract, and in accordance with the terms of specifications Nos. 2275, 2261, 2262 and 2263. The right is reserved to reject any or all bids. Drawings and specifications may be consulted at the Middletown State Homeopathic Hospital, Middletown, N. Y., at the New York office of the Department of Architecture, Room 1224 Woolworth Building, and at the Department of Architecture, Capitol, Albany, N. Y. Drawings and specifications and blank forms of proposals may be obtained at the Department of Architecture, Capitol, Albany, N. Y., upon the deposit of a certified check in the sum of $10.00, made payable to the State of New York for each set of plans and specifications, which check will be returned if plans and specifications are sent back in good condition to the State Architect, Lewis F. Pilcher, Capitol, Albany, N. Y.

E. S. ELWOOD, Secy., State Hospital Commission.
Dated Albany, N. Y., June 7, 1915.

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Bids received until July 9, 1915.

Wood Block and Asphalt Paving

Chattanooga, Tenn.

Sealed proposals, directed to the undersigned, will be received at the office of the Commissioner, Department of Streets and Sewers, until 10 o'clock A.M., July 9, 1915, for repaving portions of Market and East Ninth Streets. Bids are invited for both Creosoted Wood Block and Sheet Asphalt paving. The extent of the repaving covers about 20,000 square yards. Blank forms for proposal and specifications will be furnished on application to the undersigned, the applicant enclosing with his application the sum of $5.00, which amount will be returned on the receipt of a bona fide bid from such applicant. A certified check for $1000.00, payable to J. M. Payne, City Treasurer, must accompany each bid. The successful bidder will be required to execute a Surety Company bond for one-third the estimated amount of the contract, conditioned on the faithful performance of the requirement of the contract and the payment for the labor and materials used therein. The right is reserved to reject any or all bids.

E. D. BASS, Commissioner,
Dept. Streets and Sewers.

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Bids received until July 6, 1915.

Notice to Bridge Contractors

Belvidere, N. J.

Sealed bids or proposals will be received by a committee of the Board of Chosen Freeholders of the County of Warren at the Court House in Belvidere, N. J., on Tuesday, July 6, 1915, for the construction of two I-Beam Bridges.

One is located one mile north of Columbia, N. J., and is known as Moore's Bridge. The other is located near Barber's Farm, 1½ miles from Johnsonsburg, N. J.

Bids on the Moore Bridge will be opened on the above date at 11:45 A.M., and on the other bridge at 2 P.M.

Plans and specifications are on file at the Columbia Hotel, Columbia, N. J.; at the Blairstown Hotel, Blairstown, N. J.; at the Johnsonsburg Hotel, Johnsonsburg, N. J.; and at the office of F. W. Salmon, County Engineer, Netcong, N. J.

Each bid must be accompanied by a certified check made payable to the Director of the Board of Chosen Freeholders in the sum of $300 to guarantee the proper execution of contract and bond by the successful bidder on demand.

The right is reserved to reject any or all bids.

J. R. THATCHER,
Director of Board of Chosen Freeholders.

Bids received until July 7, 1915.

Reservoir and Filtration Plant

Port Henry, New York.

Sealed proposals endorsed, "Proposals for Installing Reservoir and Filtration Plant," and addressed to the undersigned will be received at the office of the Village Clerk of Port Henry, New York, until 8:00 P.M., July 7th, 1915, at which time and place all bids received therefor will be publicly opened and read.

The work for which these proposals are invited is near the Corporate limits of the Village of Port Henry and consists in the Construction and complete Installation of a new 1,000,000 gallon Concrete Lined Storage Reservoir and a new 250,000 gallon covered Slow Sand Filter with Sand Washing Apparatus, and all Appurtenances and Connections, and is to be finished complete in every detail ready for operation and occupancy by the Village.

All proposals must be made upon the blank form of proposal supplied by the Village Clerk. A certified check in the sum of 5% of the amount bid must accompany the proposal as a guarantee that the bidder will enter contract if awarded, and furnish bond for faithful performance in the amount of 50% of contract price.

Plans and Specifications of the work may be seen at the Office of the Village Clerk and at the office of Mortimer Y. Ferris, Civil Engineer, Ticonderoga, N. Y., or may be obtained for the sum of $5.00 per set on application to Village Clerk.

Bids submitted shall be open for acceptance until August 6th, 1915. The Board reserves the right to reject any and all bids.

A. C. LINDIN, Village Clerk,
Port Henry, New York.

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Bids received until July 21, 1915.

Reinforced Concrete Buildings

New Orleans, La.

Sealed proposals will be received by the Board of Commissioners of the Port of New Orleans at their office, Suite 200, New Orleans Court Building, until July 21, 1915, at 2 o'clock P.M., and then publicly opened, for the construction of reinforced-concrete buildings for the Cotton Warehouses and Terminal, including the two-story Wharf House, about 120 feet by 2000 feet, Warehouse "E" about 150 feet by 580 feet, with their attached runways and appurtenances, located on the Mississippi River near Valence Street, in New Orleans.

A deposit of $25,000 in cash or certified check is required with proposal. Bond of $300,000 required with contract.

Payments monthly to the extent of 90% of the Engineers' estimate of work accomplished, including allowance for a reasonable stock of material.

On and after June 10, 1915, plans and specifications will be on file at the office of Ford, Bacon & Davis, No. 921 Canal Street, New Orleans, La., by whom full sets will be furnished to prospective bidders, on deposit of $100, which will be refunded to depositors who submit proposals and return sets in good condition. To depositors who do not submit proposals $80.00 will be refunded on return of the set in good condition.

The right is reserved to reject any and all bids and to waive informalities.

(Signed) ERNEST M. LOEB, President.

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Bids received until July 7, 1915.

Pumps on Floats

Sealed Bids will be received by the Board of Water Supply, at its offices, twenty-second floor, Municipal Building, Park Row, Centre and Chambers Streets, New York City, until 11 A.M., on Wednesday, July 7, 1915, for Contract 140, for furnishing, delivering and erecting at Shafts 11 and 21 of the City tunnel of the Catskill aqueduct in the City of New York, drainage equipment for unwatering the tunnel and its shafts.

At the above place and time the bids will be publicly opened and read. Pamphlets containing information for bidders, and contract drawings can be obtained at the above address, at the office of the Secretary, by depositing the sum of ten dollars ($10) in cash or its equivalent for each pamphlet. For further particulars apply to the office of the Principal Assistant Engineer at the above address.

CHARLES STRAUSS, President,
CHARLES N. CHADWICK,
JOHN F. GALVIN,
Commissioners of the Board of Water Supply.
W. BRUCE COBB, Secretary.

Bids received until July 2, 1915.

Street Improvements

DEPARTMENT OF PUBLIC WORKS

Philadelphia, Pa.

Sealed proposals will be received until 12 o'clock noon on Friday, July 2nd, 1915, and opened at that time in Room 225, City Hall, for the improvement of the South Broad Street Plaza from Oregon Avenue to Bigler Street between Thirteenth Street and Fifteenth Street.

Estimated quantities of the principal items of work to be done are as follows:

Earth Grading	21,500 cu.yds.
Topsoil and Grass Seeding	14,500 sq.yds.
Reinforcing Rods	14,841 pounds
Concrete Footways	9,700 sq.yds.
Granite Balustrade	
Reinforced Concrete Basins	2
Granite Curbing	3,670 lin.ft.
Vitrified Pipe Drains	2,733 lin.ft.
Water Pipe	1,560 lin.ft.
Drinking Fountains	2
Trees	216

Together with the necessary incidental work.

A charge of five (5) dollars will be made for each set of specifications and drawings, which will be refunded upon the return of the unused specifications and drawings in good condition, or upon the return of the drawings in case a bid is submitted.

Inquire at Room 232, City Hall, Philadelphia.

M. L. COOKE, Director.

Bids received until July 8, 1915.

Bridge Construction

DEPARTMENT OF PUBLIC WORKS.

Philadelphia, Pa.

Sealed proposals will be received until 12 o'clock noon, on Thursday, July 8, 1915, and opened at that time in Room 225, City Hall:

Bridge on line of Fifth Street
Bridge on line of Third Street
Bridge on line of Fisher Avenue.

Inquire at Room 416, City Hall, Philadelphia.

M. L. COOKE, Director.

Contractors

BIDS OPENED JULY 9, 1915

Proposals wanted for track-laying on the New Utrecht Avenue Elevated Line in Brooklyn. Rails, ties, etc., to be furnished by the City of New York, the contractor to do the work of installing the tracks exclusive of electrical and signal apparatus.

This line runs from a connection with the Fourth Avenue subway at about 38th Streeet, through open cut to New Utrecht Avenue and as an elevated railroad over New Utrecht Avenue, Stillwell Avenue and 86th Street to Coney Island.

Write or call concerning contract, plans and specifications. PUBLIC SERVICE COMMISSION FOR THE FIRST DISTRICT, 154 Nassau Street, New York City.

Barge Canal Contract to Sub-Let

Mechanicville, N. Y.

Bid wanted on construction of approach wall to Lock No. 3, Mechanicville, New York, Barge Canal Contract No. 72A. Work will be let under subcontract. Full information given on request. JAMES STEWART & CO., INC., 30 Church St., New York, N. Y.

PROPOSALS FOR RIPRAP STONE—U. S. Engineer Office, Philadelphia, Pa.—Sealed proposals will be received here until 12 noon, July 8, 1915, and then opened, for furnishing and placing riprap in Delaware River at Artificial Island. Further information on application.

SEALED PROPOSALS will be received at the Office of the Lighthouse Inspector, Tompkinsville, N. Y., until 2 o'clock p.m., July 9, 1915, and then opened, for furnishing labor and materials for erecting a reinforced-concrete carpenter shop at General Lighthouse Depot, Tompkinsville, N. Y. Blank proposals and particulars may be had by addressing the above office.

PROPOSALS FOR AIR-COMPRESSOR PLANT—U. S. Engineer Office, Pittsburgh, Pa.—Sealed proposals for furnishing and installing a water-power driven air-compressor plant, at Dam No. 10, Ohio River, will be received at this office until 12 M. (Eastern Standard Time), June 30, 1915, and then publicly opened. Information on application.

Bids received until July 2, 1915.

Proposals for State Road Work

Hartford, Conn.

Sealed Proposals will be received by the State Highway Commissioner, Room 27, Capitol, Hartford, Conn., until 2 P.M., Friday, July 2, 1915, for the following sections of state road work in accordance with plans and specifications on file in the office of the State Highway Commissioner and at the following places:

TOWN OF ASHFORD, about 14,960 linear feet of Gravel construction. Plans and specifications at Selectmen's office, Warrenville. TOWN OF BETHEL; about 6,315 linear feet of Gravel construction. Plans and specifications at the Town Clerk's Office, Bethel. TOWN OF CANTERBURY; about 5,100 linear feet of Native Stone Macadam construction, and about 1,995 feet of Native Stone Resurfacing. Plans and specifications at Town Clerk's Office, Canterbury. TOWN OF GLASTONBURY; about 6,500 linear feet of 2" Bituminous Macadam construction. Specifications at Town Clerk's Office, Glastonbury. TOWN OF KILLINGWORTH; about 7,150 linear feet of Graded construction. Plans and specifications at Town Clerk's Office, Killingworth. TOWN OF NEWTOWN; about 8,040 linear feet of Native Stone construction. Plans and specifications at Town Clerk's Office, Newtown. TOWN OF PLAINFIELD; about 6,875 linear feet of Gravel construction. Plans and specifications at Town Clerk's Office, Central Village. TOWN OF SPRAGUE; about 1,630 linear feet of Gravel construction. Plans and specifications at Post Office, Versailles. TOWN OF VERNON; about 2,675 linear feet of 6" Bituminous Macadam construction. Plans and specifications at Town Clerk's Office, Rockville. TOWN OF WOODSTOCK; construction of 25 ft. Span Reinforced Concrete "T" Beam Bridge over Mill Brook on the Putnam-Woodstock Road in the Village of South Woodstock. Plans and specifications at office of E. C. Welden, Div. Eng., Jordon Block, Willimantic. TOWN OF WATERFORD; construction of 10 ft. Reinforced Concrete Slab Culvert located on the New London-Lyme Turnpike over Jordon Brook, Waterford. Plans and specifications at office of C. A. Campbell, Div. Eng., No. 32 Church St., Norwich. All bids must be accompanied by a surety company bond or a certified check not less than one-third of the cost of the work. The State Highway Commissioner reserves the right to reject any and all bids.

C. J. BENNETT, State Highway Commissioner,
Room 27, Capitol, Hartford, Conn.

Dated at Hartford, Conn., June 22, 1915.

Bids received until July 7, 1915.

Intercepting Sewer in Tunnel

Cleveland, Ohio.

Sealed proposals will be received at the office of the Commissioner of Purchases and Supplies, Room No. 511 City Hall, until 12 o'clock, July 7th, 1915, for constructing, under two contracts, in tunnel, approximately 7500 lineal feet of a 6-ft. circular brick sewer.

Copies of plans and specifications and blank proposals can be obtained at the office of the Commissioner of Engineering, Rooms No. 413 and 417 City Hall, after June 21st, 1915.

The proposal must contain the full name of the party or parties making the same and all persons interested therein and must be accompanied by a proposal bond signed by a surety company authorized to do business in the State of Ohio or by a certified check for Five Thousand ($5000.00) Dollars, payable to the City of Cleveland, on a solvent bank, as surety that if the bid be accepted a contract will be entered into and the performance of it properly secured.

No proposal will be entertained unless made on the blanks furnished by the Commissioner of Engineering and delivered at the office of the Commissioner of Purchases and Supplies, Room No. 511, City Hall, previous to 12 o'clock M., Eastern Time, on the day specified.

The City reserves the right to reject any or all bids.

A. R. CALLOW,
Commissioner of Purchases and Supplies.

Steel Viaducts

The Siamese Royal Railway Department invites bids for three steel viaducts. Specifications and drawings may be obtained from the Siamese Legation, Gloucester, Mass., on payment of fee of four dollars per set.

PROPOSALS FOR COAL.—U. S. Engineer Office, Wilmington, N. C.—Sealed proposals will be received here until 12 M., June 28, 1915, and then opened for furnishing about 13,000 tons of bituminous coal. Further information on application.

U. S. ENGINEER OFFICE, Room 707, Army Building, 39 Whitehall St., New York, N. Y.—Sealed proposals will be received here until 12 M., June 28, 1915, and then opened, for dredging in Newtown Creek, N. Y. Further information on application.

U. S. ENGINEER OFFICE, Newport, R. I., May 29, 1915.—Sealed proposals for rebuilding basin walls and repairing breakwaters and harbor walls at harbor at Block Island, R. I., will be received here until 12 o'clock noon, June 29, 1915, and then publicly opened. Information on application. JOHN MILLIS, Col., Engrs.

PROPOSALS FOR LOCK GATES—U. S. Engineer Office, Wilmington, N. C.—Sealed proposals will be received here until 12 M., July 19, 1915, and then opened for furnishing steel lock gates. Further information on application.

PROPOSALS FOR REPAIRS, SOUTH DOCK, ETC.—Office Quartermaster, West Point, N. Y.—Sealed proposals will be received here until 12 M., June 30, 1915, and then opened, for reconstruction and repairs to South Dock and Ferry Slip. Further information application.

U. S. ENGINEER OFFICE, Room 802, Army Building, 39 Whitehall Street, New York City.—Sealed proposals for dredging in Hackensack River, N. J., and Channel north of Shooters Island, N. Y. and N. J., will be received here until 12 M., July 15, 1915, and then opened. Bids for one or both of these works will be considered. Information on application.

PROPOSALS FOR LEVEE WORK—Mississippi River Commission, 1st & 2d Districts, Room 20, Custom House, Memphis, Tenn., June 4, 1915.—Sealed proposals for constructing about 700,000 cubic yards of levee work in the Lower St. Francis Levee District will be received at this office until 11 a.m., June 26, 1915, and then publicly opened. Information upon application. E. M. MARKHAM, Maj., Engrs.

U. S. ENGINEER OFFICE, 305 Southern Building, Washington, D. C.—Sealed proposals for furnishing materials and erecting complete a brick storehouse in McMillan Park will be received here until 12 M., July 17, 1915, and then publicly opened. Information on application.

PROPOSALS FOR LEVEE WORK—Office of Third Mississippi River District, P. O. Box 404, Vicksburg, Miss.—Sealed proposals will be received here until 11 a.m., July 12, 1915, and then opened, for constructing about 1,415,000 cubic yards of levee work. Further information on application.

U. S. ENGINEER OFFICE, 337 Federal Building, Detroit, Mich.—Sealed proposals for furnishing and delivering at Sault Ste. Marie, Michigan, about 325 tons of steel, etc., for construction of Fourth Lock, will be received at this office until 12 noon, June 30, 1915, and then publicly opened. Information on application.

U. S. ENGINEER OFFICE, Jacksonville, Fla.—Sealed proposals will be received here until 12 noon, July 24, 1915, and then opened, for dredging and rock removal in St. Johns River, Fla. Further information on application.

U. S. ENGINEER OFFICE, Room 305 Southern Building, Washington, D. C., May 27, 1915.—Sealed proposals for furnishing and delivering 300 tons, 25% more or less, Sulphate of Alumina will be received here until 12 M., June 26, 1915, and then publicly opened. Information on application.

U. S. ENGINEER OFFICE, 337 Federal Building, Detroit, Mich.—Sealed proposals for furnishing and delivering about 236,000 feet, B.M. of fir timber, will be received at this office until 12 M., July 31, 1915, and then publicly opened. Information on application.

TREASURY DEPARTMENT, Supervising Architect's Office, Washington, D. C., June 18, 1915.—Sealed proposals will be opened in this office at 3 p.m., July 30, 1915, for the construction complete (including mechanical equipment, interior lighting fixtures, and approaches) of the United States post office at Albion, Mich. Drawings and specifications may be obtained from the custodian of site at Albion, Mich., or at this office, in the discretion of the Supervising Architect. JAS. A. WETMORE, Acting Supervising Architect.

Classified Advertising

Positions Wanted, 3 cents a word, minimum charge 50 cents an insertion, payable in advance.

Positions Open, (Civil Service Examinations), **Employment Agencies** (Labor Bureaus), **Business Opportunities, Wanted** (Agents and Salesmen—Contract Work), **Miscellaneous** (Educational—Books), **For Sale,** 5 cents a word, minimum charge $1.00 an insertion.

Count four words for keyed address care of New York; five for Chicago. Abbreviated words or symbols count as full words.

Copy should reach us not later than 10 A.M. Wednesday for that week's issue. Answers addressed to our care, Tenth Avenue at Thirty-sixth St., New York or 1144 Monadnock Block, Chicago will be forwarded (excepting circulars or similarliterature).

No information given by us regarding keyed advertiser's name or address. Original letters of recommendation or other papers of value should not be inclosed to unknown correspondents. Send copies.

Advertisements calling for bids, $3.60 an inch per insertion.

POSITIONS WANTED

Mechanical and Electrical Engineers

MECHANICAL ENGINEER, 35, technical school and 12 years' broad experience; New York interview. P. W. 326, Eng. News.

MECHANICAL ENGINEER, 31, technical man with three years' shop training; six years' experience laying out manufacturing plants; specialist on production methods and labor-saving devices, arrangement of machine tools and manufacturing departments, savings in power, handling of material and increase of production; best of references from past employers and clients; can give part or whole time; New York or eastern Jersey preferred; good chance to get the man you need. P. W. 383, Eng. News.

Civil Engineers

WATER-SUPPLY, water power, dams, sewers; responsible charge, construction and design; present engagement soon terminates; age 34; Assoc. M. Am. Soc. C. E. P. W. 224, Eng. News.

CIVIL ENGINEER, technical graduate, Assoc. M. Am. Soc. C. E.; 15 years' experience hydraulic construction, municipal work, management and construction of water-works; business experience; $3600; now employed. P. W. 345, Eng. News.

CIVIL ENGINEER; 28, single, American, technical, railroad location, design and construction, hydro-electric, water works, subways, tunnels, reports and estimates; tropics and north, speak Spanish. P. W. 261, Eng. News.

CIVIL ENGINEER, graduate, Assoc. M. Am. Soc. C. E., 15 years' experience, responsible charge general construction, railroads and municipal improvements, surveys, expert computer, have instruments. P. W. 284, Eng. News.

CIVIL ENGINEER, Assoc. Mem. A. S. C. E., 18 years' experience, municipal roads, bridges, reinforced concrete. Complete outfit, both office and field. References. P. W. 329, Eng. News, Chicago.

CIVIL ENGINEER, technical graduate, desires position; 11 years' experience steam and electric railway maintenance and construction, reinforced-concrete bridge construction, large drainage canal work, difficult swamp drainage surveys; speaks and writes Spanish fluently; references; location immaterial. P. W. 360, Eng. News.

CIVIL ENGINEERING STUDENT; 20; technical, topographic and railroad drafting, computations; desires to permanently locate with engineer or firm; references, samples. P. W. 438, Eng. News.

CIVIL ENGINEER, college graduate; 15 years' general municipal consulting engineering experience; water works a specialty; design and construction, earth, masonry, concrete, steel; reports, appraisals; excellent references; minimum salary, $150. P. W. 369, Eng. News.

CIVIL ENGINEER, ex-army officer, just returned, study abroad hydrographic and topographic improvements, seeks opening. Accustomed to handle men. Vigorous and will go anywhere. P. W. 407, Eng. News.

GRADUATE CIVIL ENGINEER; 10 years' broad construction experience. Responsible charge design and construction; sewage, dams, hydraulics, reinforced concrete. Age 34, Assoc. M. Am. Soc. C. E. P. W. 410, Eng. News.

CIVIL ENGINEER, 11 years' varied experience, steam and electric railroad construction, location and valuation surveys; excellent highway experience; at present in charge of work. P. W. 411, Eng. News, Chicago.

CIVIL ENGINEER, 32, ten years' experience in U. S. and tropics. Topographic, hydrographic and construction surveys. Drafting, concrete inspection, pipe line, highway and R.R. location. P. W. 414, Eng. News.

CIVIL ENGINEER, technical graduate, five years' experience on railroad, bridge and building work, survey design and construction desires engagement. P. W. 419, Eng. News.

CIVIL ENGINEER, 17 years' experience, surveys and construction railways and hydraulic development; good draftsman; speak Spanish. P. W. 418, Eng. News.

GRADUATE CIVIL ENGINEER, 12 years' experience, 6 in general civil and 6 in frog and switch work desires permanent position. P. W. 417, Eng. News, Chicago.

CIVIL ENGINEER, graduate; six years' experience with engineers and contractors; railroads, sewers, power plants, subways; New York interview. P. W. 431, Eng. News.

GRADUATE CIVIL ENGINEER desires position; five years' experience, railway and municipal improvements. P. W. 425, Eng. News.

NO SALARY WANTED; will work for the experience acquired; civil engineer, Slav, 26; construction work, field or office. P. W. 421, Eng. News.

Bridge and Structural

STRUCTURAL ENGINEER having successfully filled positions as designer, draftsman in charge, and assistant engineer, open for engagement. Can handle correspondence, some experience selling, fair knowledge shop and erection costs. Age 34. Reference from present employer covering 12 years. Could invest small amount. P. W. 332, Eng. News.

STRUCTURAL ENGINEER. Experienced designer, good executive, accustomed to handling men desires position as engineer or in charge of work; excellent references from past and present employers. P. W. 316, Eng. News.

STRUCTURAL ENGINEER AND ESTIMATOR; 10 years' experience surveys, construction, detailing, estimating, designing; bridges and buildings; technical graduate. P. W. 429, Eng. News.

STRUCTURAL ENGINEER; graduate, ten years' experience checking ore bridges, coal tipples, industrial plants, office buildings, etc. P. W. 408, Eng. News, Chicago.

ENGINEER, structural, open for an engagement; 15 years' experience designing and estimating bridges, tall buildings, mill buildings, factories, etc., both in steel and reinforced concrete; three years assistant chief engineer for large construction company. P. W. 427, Eng. News.

STRUCTURAL ENGINEER, graduate, 10 years' experience, designing, detailing bridges, industrial plants, filtration, hydro-electric power. P. W. 409, Eng. News.

Surveyors

TRANSITMAN AND DRAFTSMAN, twelve years' experience, topographical, municipal, one year mechanical drafting. P. W. 393, Eng. News.

INSTRUMENTMAN; 10 years' experience (field and office) in general surveying, desires position. P. W. 428, Eng. News.

YOUNG MAN desires position as rodman or chainman; location immaterial; experienced. P. W. 426, Eng. News.

Draftsmen

ENGINEERING DRAFTSMAN desires position, three years' experience in subway and elevated construction. Expert track designer. P. W. 413, Eng. News.

YOUNG MAN, 28, single, technical graduate, wants position as draftsman, or in a surveying party, or at anything in engineering. Handle labor, speak Spanish, best reference and recommendation. Salary, locality immaterial. Object experience and advancement. P. W. 412, Eng. News.

STRUCTURAL DRAFTSMAN, technical graduate, age 41, married; thorough experience in checking, detailing and designing representative structures; 12 years with prominent consulting engineers; salary $150. P. W. 433, Eng. News.

DRAFTSMAN (Junior) mill building, designing, detailing, tracing, accurate. P. W. 403, Eng. News.

Superintendents, Etc.

SUPERINTENDENT OF STREET PAVING; ten years' experience in Eastern cities and familiar with city hall affairs. P. W. 379, Eng. News.

SALES ENGINEER, technical man, 30; six years with firm consulting engineers in New York City; large acquaintance among manufacturers, consulting and industrial engineers, and mill architects in East; hustler and a man who can produce results; would like to represent manufacturer in East; have made good and can give best of references from past employers; if you want a live representative write at once. P. W. 384, Eng. News.

ENGINEER, 15 years' experience machinery design and general engineering work; can readily adapt himself to new work and develop propositions from engineers' specifications; technical education. P. W. 430, Eng. News.

TECHNICAL GRADUATE, 25, wants position, estimator, assitant engineer or timekeeper; two years' experience. P. W. 432, Eng. News.

DESIGNER AND DETAILER of reinforced-concrete and heavy steel structures; also railroad alignment and field inspection; technical graduate; four years' experience. P. W. 437, Eng. News.

CONTRACTING ENGINEER, technical graduate; seven years' experience in estimating, designing and erecting of reinforced-concrete construction; also broad experience in soliciting new business; feel qualified to take complete charge of contracting office; extensive clientage; best of references. P. W. 434, Eng. News.

YOUNG MAN with nine years' experience in surveying and construction desires position with engineer or contractor. P. W. 435, Eng. News.

SUPERINTENDENT desires position; 15 years' experience reservoir and dam construction, tunnel, trench and timber work; heavy masonry, concrete, stone cutting and quarry, earth, rock, pipe, sewers, road construction. P. W. 422, Eng. News.

ASSISTANT FOREMAN or timekeeper by congenial Italian young man. Read and talk Italian and English. P. W. 406, Eng. News, Chicago.

YOUNG MAN, college student, thorough knowledge of surveying, desires position. Own field and drafting instruments. Present location unsatisfactory. P. W. 420, Eng. News.

MAN wishes to connect with a responsible concern selling building materials; thoroughly acquainted with contractors and architects throughout the state. P. W. 436, Eng. News.

CORNELL GRADUATE, 14 years' experience engineering, maintenance, construction, purchasing and selling, desires position with manufacturing or engineering firm. P. W. 423, Eng. News.

TECHNICAL MAN, 24, seven years' power-plant experience wishes position as general assistant to consulting engineer. P. W. 424, Eng. News.

POSITIONS OPEN

ENGINEER experienced in designing and estimating all types of reinforced concrete construction, to take entire charge of engineering office. Must have had at least ten years practical experience original designing. Must be resourceful and able to redesign when necessary to effect economy. Have important position to right man. Salary $200 per month to start. Work near New York. When replying give full particulars of education and experience. Personal interview will be granted before examining references. All replies confidential. P. 405, Eng. News.

DRAFTSMAN wanted with experience in conveying machinery and structural steel or concrete. P. 415, Eng. News.

MECHANICAL ENGINEER; for position as chief draftsman and estimator; must have experience in structural detailing and electric or steam hoists or similar work. Give full particulars as to education, experience, references and salary required. P. 404, Eng. News.

MECHANICAL ENGINEER for the middle west, college graduate with practical experience preferably in chemical plant. State age, experience, salary expected, etc. P. 416, Eng. News, Chicago.

Employment Agencies

The Employment Agencies advertising in this paper agree to refund any registration fee on demand any time within the first six months when no position is secured.

TECHNICAL ENGINEERS in every line for available positions; employers and applicants write The Toledo Engineering Agency, Toledo, Ohio.

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[36" Gauge]

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[24" Gauge]

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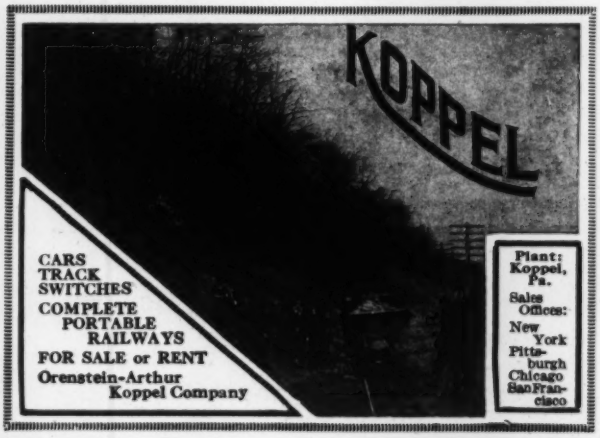

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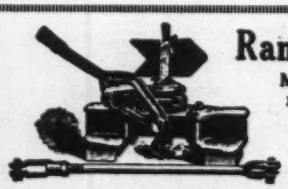

Ramapo Iron Works

Main Office, Hillburn, N. Y.

New York Office, 30 Church St.

Switch Stands, Plantation Cars, Switches, Frogs, Etc.

Engineering News

Volume 73, No. 25
Issued Every Thursday
Hill Publishing Company

NEW YORK, JUNE 24, 1915

Price, 15 Cents
Contents, First Page
Advertising Index, Last Page

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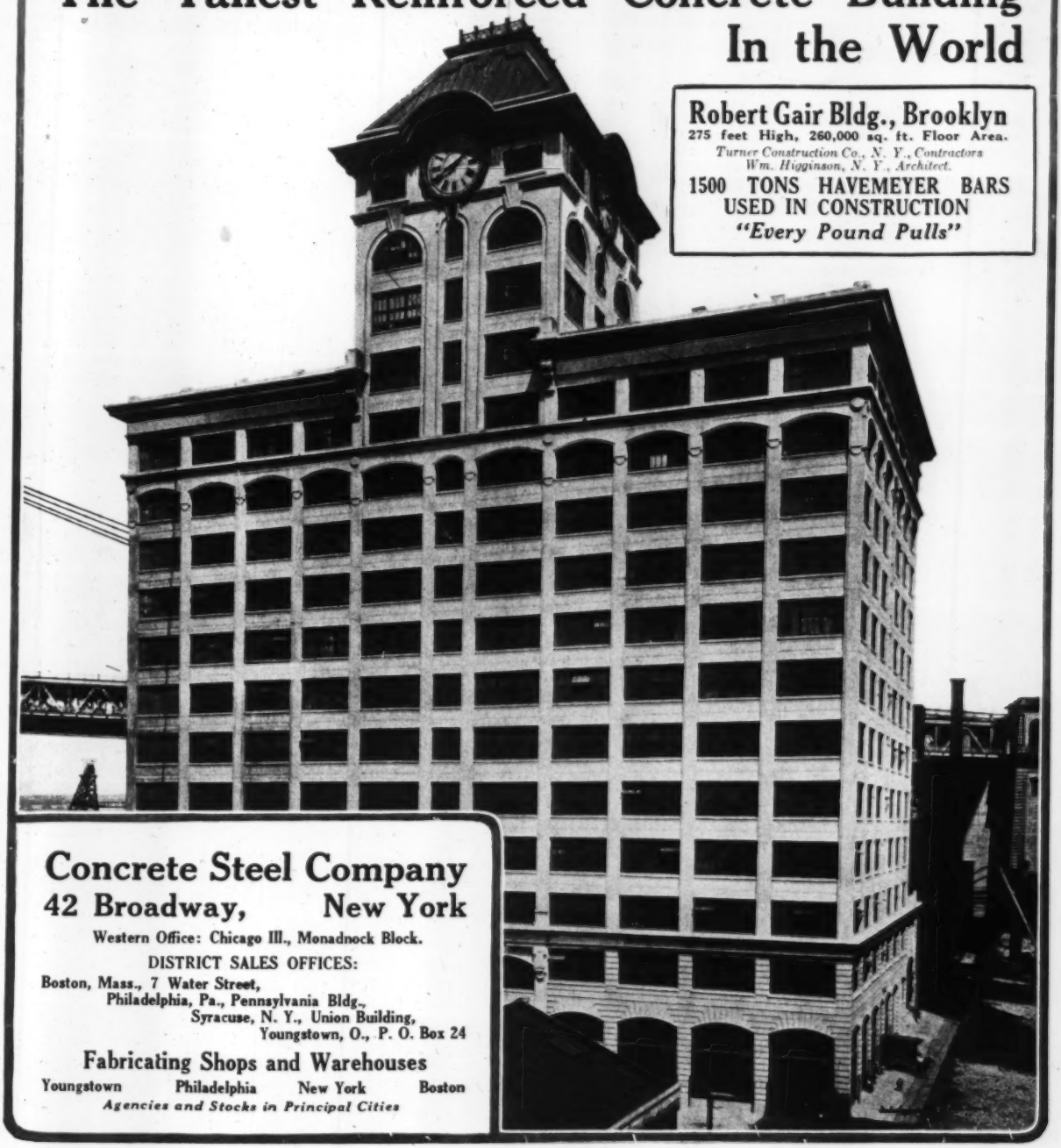
The Tallest Reinforced Concrete Building In the World

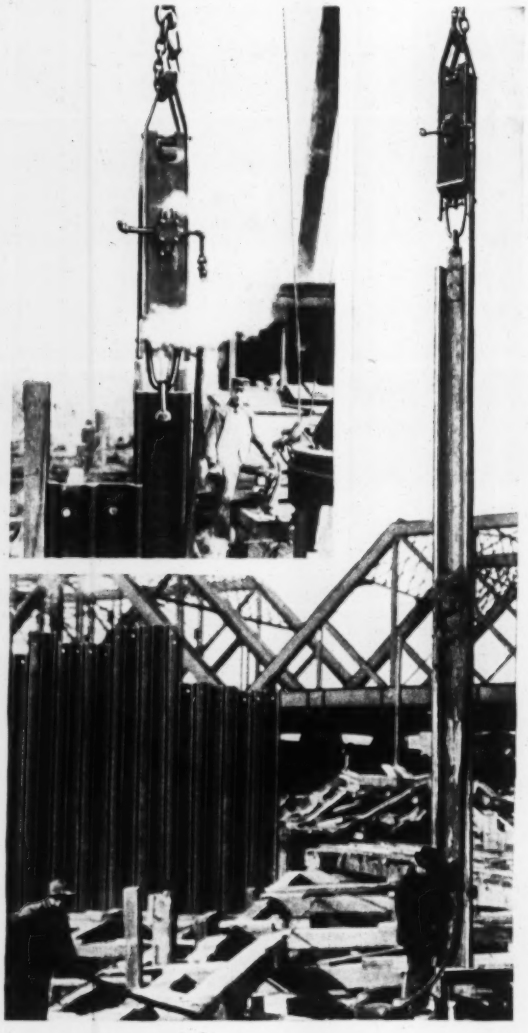
Robert Gair Bldg., Brooklyn
275 feet High, 260,000 sq. ft. Floor Area.
Turner Construction Co., N. Y., Contractors
Wm. Higginson, N. Y., Architect.
1500 TONS HAVEMEYER BARS USED IN CONSTRUCTION
"Every Pound Pulls"



Concrete Steel Company
42 Broadway, New York
Western Office: Chicago Ill., Monadnock Block.
DISTRICT SALES OFFICES:
Boston, Mass., 7 Water Street,
Philadelphia, Pa., Pennsylvania Bldg.,
Syracuse, N. Y., Union Building,
Youngstown, O., P. O. Box 24
Fabricating Shops and Warehouses
Youngstown Philadelphia New York Boston
Agencies and Stocks in Principal Cities

Pulling Lackawanna Steel Sheet Piling by means of an inverted steam hammer

Contractors who figure upon reusing Lackawanna Steel Sheet Piling for a number of temporary installations before a final permanent installation or selling as scrap, can pull the driven piling sections by various practical methods.



A recent scheme for utilizing an inverted steam hammer for pulling is shown in the accompanying illustrations. This idea, used by N. R. Melvin, Supt., McMullen & Hoff, greatly reduced pulling costs on deep driven Lackawanna Sheet Piling in Lexington Avenue Subway work, New York City.

A steel strap about 4 in. wide was passed entirely around the hammer over the anvil blocks and fitted with a simple shackle at the upper end (lower end in pulling). The 3½-in. space on each side of the strap was occupied by other straps to provide attachment to the derrick. In pulling, the inverted hammer took hold of the pile by means of a shackle and the derrick was then caused to pull upward. This pulled the center or shackle strap down upon the anvil block, and the hammer was started working. The larger picture shows how the shackle is attached to special plates which are bolted to the lower half of a spliced piling section, utilizing the splice plate holes for the bolts.

The hammer used, 11x11x56-inch McKiernan-Terry, weighs 1500 pounds, has 7-inch cylinder bore and stroke, and is fitted with a 200-pound ram. Its normal speed is 300 strokes per minute.

On this job piles penetrating 26 feet in clay, sand and gravel ("Ordinary hard pulling") were withdrawn in from 2 to 10 minutes each.

Other desirable pulling methods and devices are illustrated and described in our new reference book "Lackawanna Steel Sheet Piling," a copy of which will be sent on application to engineers who supervise piling work.

Data on many pulling jobs enables us to advise specifically under any given conditions and our steel sheet piling engineers are always ready to cooperate with present or prospective customers.

LACKAWANNA STEEL COMPANY

General Sales Office and Works: Lackawanna, N. Y.

NEW YORK BOSTON | BUFFALO PHILADELPHIA | CLEVELAND CINCINNATI | CHICAGO DETROIT | ST. LOUIS ATLANTA | SAN FRANCISCO

Licensees for the manufacture of Lackawanna Steel Sheet Piling:

For Great Britain and British Colonies in the Eastern Hemisphere, Cargo-Fleet-Iron Co., Ltd., Middlesborough, England. For France, Italy, Spain, French Colonies and Protectorates, Italian Colonies and Spanish Colonies in the Eastern Hemisphere: Cie Des Forges & Aciéries de la Marine et d'Homécourt, Paris, France. 202

Engineering News

CHARLES WHITING BAKER, *Editor*

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VOLUME 73 JUNE 24, 1915 NUMBER 25

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NUMBER OF COPIES PRINTED THIS ISSUE, 21,900

None sent free regularly, no returns from news companies, no back numbers.

"How I Have Been Benefited By the Advertising in Engineering News"

By E. E. THUM, *C. E.*

now connected with the University of Cincinnati; formerly Engineer, Anaconda Copper Mining Co.; Chief of Party, Tooeh Valley Ry.; Chief Engineer, North American Construction Co. and Engineer in Charge of Construction on various works etc.

Cincinnati, Ohio, May 26, 1915.

The Business Manager, Engineering News,
Hill Bldg., New York.

Dear Sir:

"How have I been benefited by the advertising in Engineering News?"

"How have I not been benefited" would be an easier question to answer. Ever since my freshman year in college I have used the advertising as I have used my education or the "News"—something of value to be absorbed now and stored away for some future demand. The Engineering News has been absolutely invaluable to me:—the text sandwiched in between the ads is like the theory within the practice.

My own enthusiasm based on actual use, and backed by the appeal of their advertising enabled me, early in my professional life, to convince the chief that the best transits (Berger) were none too good for us boys "out at the front."

When in charge of concrete work the ("Universal") advertising and the trade literature they called to my attention encouraged me to adopt the then unusual practice of continuing operations through the winter. This, together with some revisions in the wall designs I was able to make from a "hunch" I got from another ad (Blaw) enabled me to finish a big foundation job away ahead of schedule, and earned me the best promotion I ever got.

As superintendent of construction rebuilding a large manufacturing plant, I had to work under a Chief Engineer of the old school—"guy derrick" type. I wanted some (Bronwhoist) locomotive cranes, but was turned down. Finally I urged their necessity to the Superintendent. "What could you do with it?" he asked. "What can I do with it? It will excavate concrete; dismantle old plant; unload, sort and erect building, cranes and machinery." The management was finally convinced by their advertising showing the adaptability of their crane, and we got them. In six months we had to work nights to take care of odd jobs for the operating departments. The derricks and ball gang went to the scrap yards.

There are so many incidents constantly occurring that it is hard to choose among them. An advertisement ("Golden-Anderson") of altitude valves showed me how to design a beautifully simple pipe layout and control for our fire and sprinkler system tanks.

We tested several types of patent roofings in service—one (Johns-Manville Asbestos) stood our conditions best, as we suspected it would from their advertising matter.

In arguing with the manager about the advisability of standardizing concrete forms, the only text and illustrations I found at all convincing to him were those I clipped from the ads:— and so on indefinitely.

"How have I been benefited by the advertising in Engineering News?" Ask me rather, "How have I been benefited by my education?"—the first is a part of the second. Every day I am able to suggest materials and methods found by turning over the advertising and reading pages of the "Engineering News" each week, recognizing old friends and making new acquaintances.

Very sincerely, *E. E. Thum*

Making Sure The Shell Is O.K.

Making Sure! That's it exactly. Not guessing, not trusting to luck, but making absolutely sure that the form in the ground is O.K.

With Raymond Made-In-Place Concrete Piles a steel core is driven to resistance, collapsed and withdrawn leaving a steel-lined hole in the ground.

To make sure that the enormous ground pressure is not squeezing the reinforced steel form, in the hole, out of shape, we light a piece of paper and drop it, blazing, to the bottom of the hole.

In this way we assure ourselves and everybody else on the job that each Raymond Shell is doing what we require of it—keeping back the ground pressure, excluding water and maintaining the hole to its predetermined shape.

With other methods of placing made-in-place concrete piles, no inspection, whatever, of the hole is possible.

On concrete piling problems take our advice and make sure.

A form for every pile—
A pile for every purpose.

Raymond Concrete Pile Co.

NEW YORK, 140 Cedar St. CHICAGO, 111 W. Monroe St.

Branch Offices in Principal Cities
Raymond Concrete Pile Company of Canada, Ltd., Montreal, Canada

Three Distinct Functions of The CEMENT-GUN

Sandblasting Guniting Grouting

To permanently repair a piece of defective concrete or rubble masonry.

First:

Use the Cement-Gun as a sand blast for removing all foreign substances and to insure a clean surface for bonding purposes. Simply a change of nozzle will convert the Cement-Gun into a sand blast.

Second:

Drive a few grouting pipes into the cracks at convenient intervals, sealing around them with Gunite, thus affording the means of reaching the interior fissures and filling the exterior cracks.

Third:

After Gunite has set, remove nozzle, fill Cement-Gun with neat cement grout, connect delivery hose to grouting pipes and force grout into interior crevices until they have been completely filled up.

No matter how hopelessly the work may be damaged the Cement-Gun may save your structure.

The Cement Gun

Send us particulars and let us submit information as to how our method may be applied to your problem.

Applying Gunite

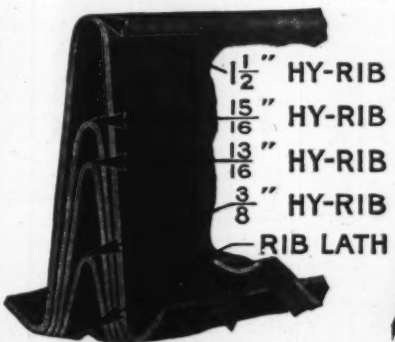
Cement-Gun Company
Incorporated
30 Church Street New York, N. Y.
Chicago Pittsburgh San Francisco

Arched Hy-Rib Roofs, Westgate Common Mills, London, England

Greatest Economy in Concrete Floors, Roofs, Sidings, Partitions, Ceilings, Furring, Etc., by Use of HY-RIB AND RIB LATH

You eliminate forms, save studs and channels, cut down labor cost, reduce dead weight, increase floor space and speed up construction by using **Hy-Rib** and **Rib Lath**; besides you secure the most satisfactory, permanent, fireproof construction.

Hy-Rib and Rib Lath are made in all depths and weights to exactly meet all requirements. We also furnish all types and sizes of steel studs, channels, corner beads, base screeds, diamond lath, etc. Our one complete service takes care of all your needs in fireproofing, metal lath and reinforcement. You thus avoid the difficulties and delays which result from depending upon a variety of sources for your materials. **Write for our new Hy-Rib Hand Book, full of valuable information. Free to persons interested in building.**

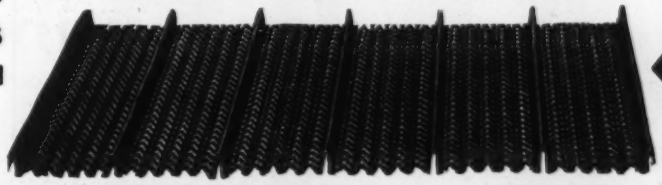


It's the Strength of the Ribs that Counts.

TRUSSED CONCRETE STEEL CO.

Dept. H.-12 YOUNGSTOWN, OHIO

Atlanta, Ga.	Dallas, Texas	Lancaster, Pa.	Pittsburgh, Pa.	Seattle, Wash.
Boston, Mass.	Denver, Colo.	Los Angeles, Cal.	Portland, Ore.	Spokane, Wash.
Buffalo, N. Y.	Detroit, Mich.	Milwaukee, Wis.	St. Louis, Mo.	Syracuse, N. Y.
Chicago, Ill.	El Paso, Texas	New York City, N.Y.	St. Paul, Minn.	Washington, D. C.
Cleveland, Ohio	Indianapolis, Ind.	Norfolk, Va.	Salt Lake City, Utah	
Columbus, Ohio	Kansas City, Mo.	Philadelphia, Pa.	San Antonio, Texas	



KAHN Building Products

Hy-Rib Concrete Sidings and Roofs, Continental Motor Mfg. Co., Detroit, Mich.

HYDRAULIC

Pressed Steel Plates for Tunnel Lining—

"Hydraulic" Pressed Steel Tunnel Liner Plates are much lighter than fabricated plate and angle liners, and they can be put into place with much less labor.

Stamped out by a steel die, they all come absolute duplicates and fit without warping, hammering or forcing into place.

Being light in weight, they reduce freight and haulage charges to a minimum.

The men carry them in stacks instead of one at a time.

Big money-savers for any contractor.

We are prepared to make all styles and sizes to suit all conditions, and shall be glad to have you send us your blueprints.

The Hydraulic Pressed Steel Co., 3152 E. 61st Street, Cleveland, Ohio

Chicago, Ill., American Metal Form Co., 1205 Fisher Bldg. Philadelphia, Pa., Lee S. Harris, Drexel Bldg.
New York, N. Y., Brown & Sites Co., 30 Church St., Louisville, Ky., Roy C. Whayne Supply Co.

"Ten acres of pressed steel capacity."

On the Trail of a Good Truck

Three Years of Mountain Climbing Has No Effect on a White Truck

OVER the Orange Mountains a 3-ton **White Truck** daily hauls and delivers building material for the John O'Rourke Company of West Orange, N. J. It has been doing this for three years—doing it satisfactorily and economically.

"O'Rourke's Truck" is known as "a good mountain truck" for miles around the home town of Thomas A. Edison. Contractor Wiseman learned this while looking over the recently completed Edison plant. Wiseman expressed a desire to get on the trail of the truck.

"The O'Rourke Company's yard is at Park Avenue and Erie R. R. only a few blocks away. Why not see the truck at the yards?" suggested his informant.

Wiseman reached the yard in time to see it loading up with bags of cement. He asked at the office about the truck's record as a mountain climber.

"We use it on all kinds of grades in hauling to construction jobs over the Orange Mountains," said Edward C. Balch, Jr., Secretary and Treasurer of the O'Rourke Company. "For three years it has given us satisfactory service and today it seems as good as ever."

Wiseman asked if the truck consumed much fuel and Mr. Balch replied that it was extremely economical.

To convince the contractor that this was true he showed his records of fuel consumption. The average was 5½ gallons daily. "The White Truck has lived up to expectations and if we were in the market for another truck we would buy another White Truck," said Mr. Balch.

"More convincing than anything else that White Trucks are good trucks is the fact that owners repeat when they go to market for another truck," commented contractor Wiseman.

Let the fact that your brother contractors buy another and another after purchasing their first White Truck convince you. If the truck didn't save them money would they "repeat?" Get on the trail of a good truck by writing now for our latest catalogs.

THE WHITE COMPANY

CLEVELAND

BOTH IN QUANTITY AND VALUE OF PRODUCTION THE LARGEST MANUFACTURERS OF COMMERCIAL MOTOR VEHICLES IN AMERICA

Concrete Pavement for Suburban Street

Highland Park, a wealthy suburb of Chicago, sought to replace its unsatisfactory macadam section of Sheridan Road—the interstate highway extending from Lincoln Park, Chicago, to Milwaukee, Wis.—with a suitable pavement that would be open to all kinds of traffic the year around. Concrete was chosen as the material which most nearly met all the requirements of permanence, moderate first cost, low maintenance charges, non-slipperiness, and varied traffic.

As shown in the accompanying diagram, the curb was built integral with the pavement. This economical method of curb construction lends itself readily to pavements built of concrete throughout.

Curb Integral With Pavement

Highland Park officials and citizens were so well pleased with their new pavement that they celebrated its opening with appropriate dedicatory exercises. The sign stretched across the street reading "Highland Park is on the Map Again" is indicative of the importance the community attached to this piece of work.

Send for a copy of the proposed standard specifications of the American Concrete Institute entitled:
"Specifications for Concrete Roads, Streets and Alleys."

UNIVERSAL
Portland Cement Co.

Dedication, Sheridan Road, Highland Park, Ill.

OFFICES
208 South La Salle St. . Chicago
Frick Building . . . Pittsburgh
Security Bank Bldg. Minneapolis

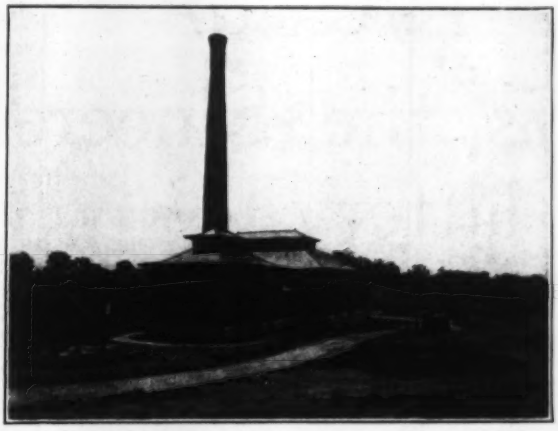
Plants at Chicago and Pittsburgh

12,000,000 Barrels Annually

CONCRETE FOR PERMANENCE

Page 9—The Venturi Page
Series III.—Venturi Engineering News No. 3

The Economical Operation of Sewage Pumps
guided by
VENTURI METERS



Main Sewage Pumping Station, Columbus, O.

Venturi Meter Tube being installed in main sewage discharge line, Columbus, Ohio.

THE MODEL sewage disposal plant at Columbus, Ohio, lifts by motor driven centrifugal pumps between forty and fifty million gallons of sewage daily against a head of forty feet.

The 40″ x 20″ Venturi Meter Tube installed in the discharge main and connected with a Type M Indicator-Recorder mounted inside of the pumping station records all variations in the rate of pumpage and shows by the Indicator dial hand the instant that rate of pumpage falls below the normal, due to clogging of the pumps through accumulated debris. It also indicates when the pump catches its suction.

By observing the indicator dial the engineer is able to avoid needless power loss, for the dial shows when it is necessary to blow back the pumps and when they should be stopped for cleaning and inspection.

The fact that the Venturi Meter enables the operating force to maintain the sewage plant at its best efficiency was commented upon by a member of the Ohio State Board of Health who remarked that the Board advocates such a device in connection with every sewage plant as it helps to save lives as well as money.

Did you read the interesting descriptions of Venturi Meter Sewage Installations at Baltimore, Toronto, Salem, etc., included in our new Bulletin No. 142-N, containing 52 reprints of Venturi Engineering News? If not, send for your copy now.

Venturi Meter Type M Indicator-Recorder.

Venturi Meters are in successful operation in water works, sewage disposal plants, hydro-electric plants, irrigation developments, steam power and refrigerating plants, gas works and in practically every important industrial undertaking.

New Bulletin No. 84-N gives full description. May we mail you a copy?

"At the Panama-Pacific Exposition we invite you to see the Venturi Meter in operation at the Pelton Water Wheel Company's Exhibit, Palace of Machinery."

Builders Iron Foundry, Providence, R. I.

BRANCH OFFICES—30 Church St., New York City. Oliver Building, Pittsburgh, Penn. The Rookery, Chicago, Ill. N. B. Livermore & Co., Merchants National Bank Building, San Francisco, Calif. Northwestern Equipment Co., Railway Exchange, Portland, Ore. Northwestern Equipment Co., Alaska Building, Seattle, Wash.

The Worm That Turned *or* Imitation is the Sincerest Flattery

CHAPTER ONE

The first experimental Pierce-Arrow motor truck was sent out for road tests in the spring of 1906. Four years of constant test and experiment convinced the Pierce-Arrow engineers that chain drive was unsuitable and inefficient for motor trucks. None of these experimental models, therefore, was ever offered for sale.

CHAPTER TWO

The Pierce-Arrow engineers then put a worm-gear truck in competition with their experimental chain-driven models. The result was so overwhelmingly in favor of the worm gear that this construction was adopted as standard for Pierce-Arrow motor trucks, and the experimental chain-driven models were scrapped.

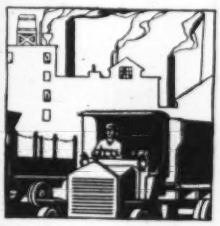
CHAPTER THREE

The first Pierce-Arrow motor truck was sold in June, 1911, and this original introduction of the worm-gear drive in America made a sensation in the motor truck field. The construction was attacked on all sides by rival manufacturers and denounced as impracticable and inefficient.

CHAPTER FOUR

Pierce-Arrow worm-gear motor trucks soon began to make good in all kinds of service and under the most exacting conditions. The worm-gear drive was proved to be silent, efficient and economical. In 1912 rival manufacturers began to buy Pierce-Arrow trucks and study the worm-gear constructions.

CHAPTER FIVE



The first hastily constructed imitations of Pierce-Arrow worm-gear drive appeared on the market in 1913, and in 1914 a number of leading manufacturers adopted the worm gear for their entire line of trucks. Service records of Pierce-Arrow trucks had shown by this time that there was no perceptible wear in the worm gear after running over 100,000 miles. More and more repeat orders were received as a result of the favorable showing made by these pioneer worm-gear trucks.

CHAPTER SIX

The trend now became increasingly strong toward worm-gear drive. A general review of the motor truck shows of 1915 indicated that out of 213 accredited makers of gasolene commercial vehicles 25% were already using worm gear while many more were preparing to adopt it next year. Nearly 2,000 Pierce-Arrow worm-gear trucks in successful operation throughout the country now bear witness to the correctness of Pierce-Arrow design and constructions.

(*To be continued in 1916*)

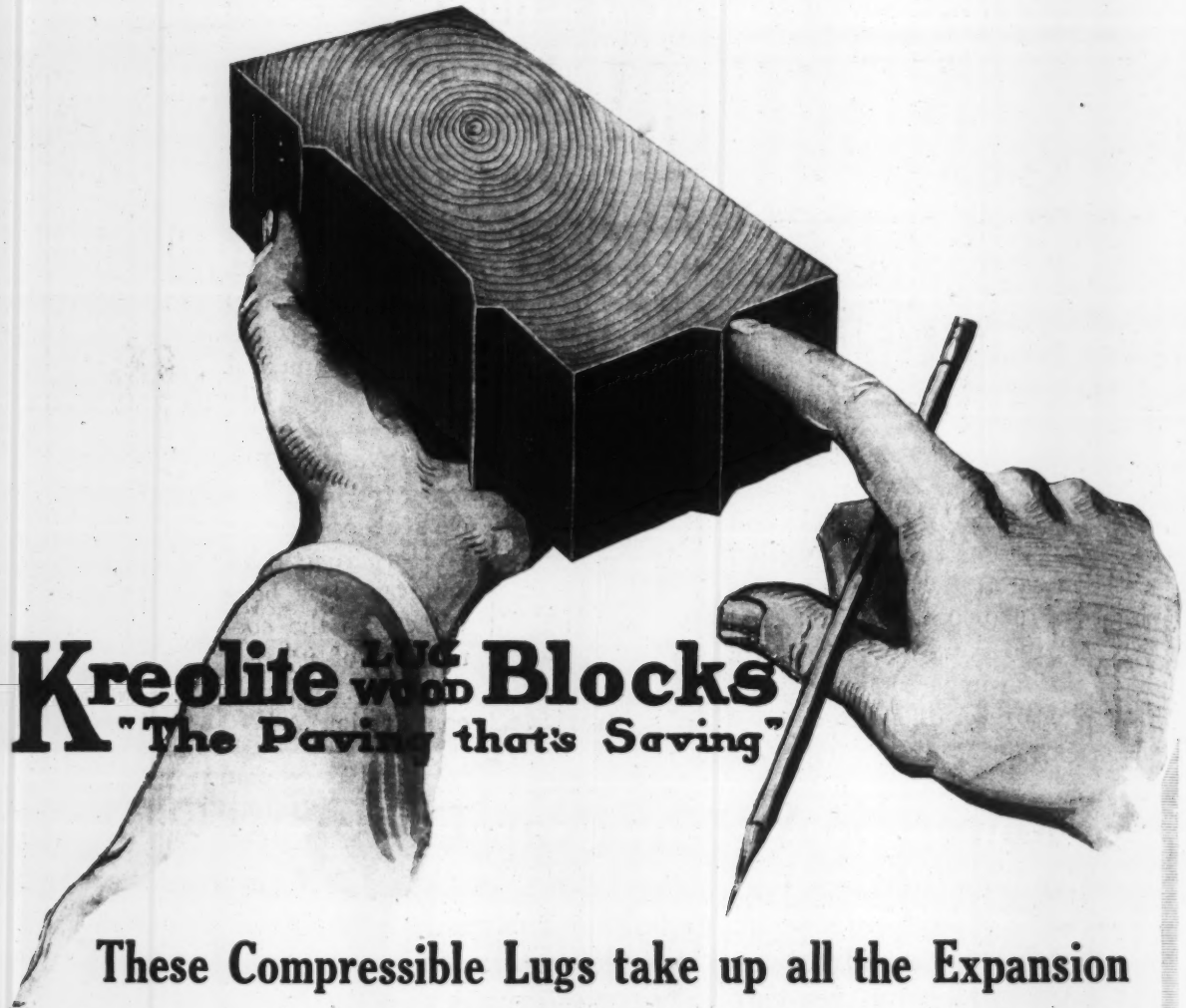
Pioneers in Worm-Gear Drive

Prospective purchasers will find in this little sketch of recent motor truck history about as strong an argument as we can offer in favor of the Pierce-Arrow truck. If recent developments have convinced you that the worm gear is the most efficient and economical drive for motor trucks, it will surely be wise to purchase a truck which has long since passed the experimental stage and now embodies the results of four and one-half years actual working experience in many different kinds of service. Such a motor truck is the Pierce-Arrow—built by the pioneers in worm-gear drive in this country. We shall be glad to send to anyone interested a catalogue of Motor Trucks showing numerous body-types for 2-ton and 5-ton chassis.

The Worm-Gear

Pierce-Arrow Motor Car Co.

BUFFALO, N. Y.



Kreolite Lug Wood Blocks

"The Paving that's Saving"

These Compressible Lugs take up all the Expansion

The Lugs on Kreolite Lug Wood Blocks are the improvement that has eliminated the only objections that have ever been made against wood block pavements, namely, bulging and slipperiness.

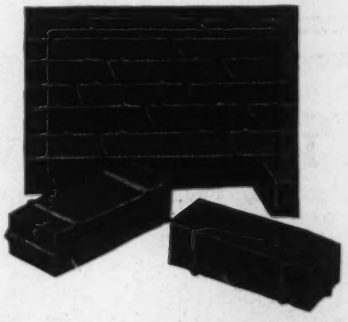
When the blocks expand the Lugs compress, preventing any bulging of the pavement.

The space provided by the Lugs gives a good foothold for horses, absolutely preventing any slipperiness.

Kreolite Lug Wood Block Pavements are being laid on grades up to 6% by both private and public corporations, also by street railway companies for paving between the rails.

A Lug Wood Block Pavement presents a smooth, even surface and one that will remain so for years to come.

Section of Kreolite Lug Wood Block Pavement—Filler not yet applied



Interesting views and specifications on request.

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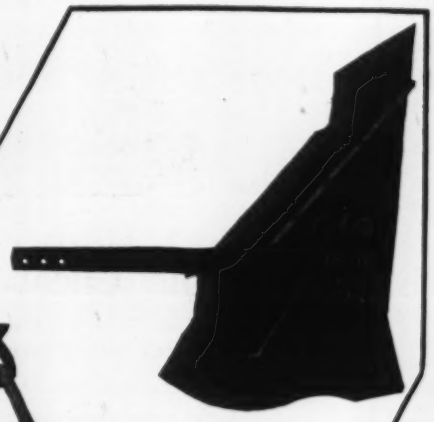
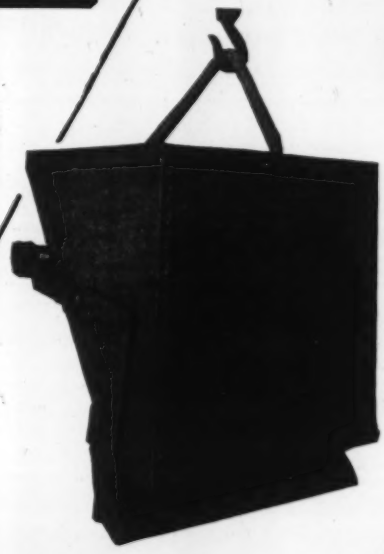
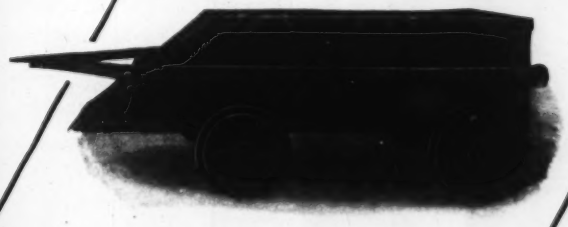
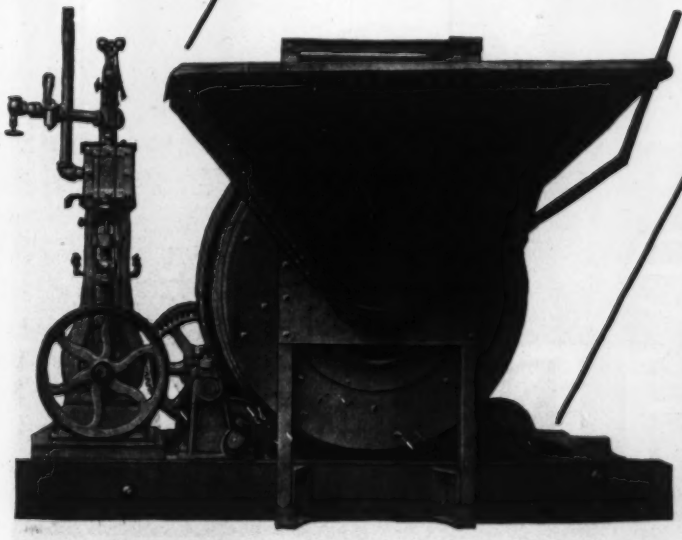
RANSOME

Stuff Stands the Gaff!









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And don't forget! The Ransome line covers everything for the handling of concrete from sand-pile to forms—everything!

Write—tell us what sort of a job you are figuring on or getting ready to start, and we'll tell you about the equipment that'll cut your costs down low.

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FOREIGN AGENTS: Buenos Aires, Venge y Cia. Casilla-Correo 1273; Copenhagen. Isidor Heimann & Co.; Milan. E. Parodi Delfino.

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A stock metal stamped drum would be cheaper.

—but the Koehring drum heads are cast from special close grained metal, high in carbon. That's why it endures the cutting, grinding wear of stone, cement and sand.

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Either set of gears will drive drum independently of companion set.

Capacities:

Pavers: 6, 11, 18, 22 cu.ft.

Side Loaders: 4, 7, 10, 12, 15, 20, 24, 30, 44 cu.ft.

Hot Mixers: 10, 18, 20 cu.ft.

Every other part of the Koehring is built, not the cheapest way, but the **best** way, and that's the reason for Koehring reliability, and low maintenance—why the Koehring is cheapest in the end.

Write for new catalog.

Pictures and describes the entire Koehring line—shows photographs of every kind of contract, valuably suggestive in mixer placing, crew-handling.

Koehring Machine Co.

Sales agencies in all principal cities.

Milwaukee, Wis.

Fig. 2184

Fig. 3141

Two Dandy Profit Boosters

Three batches at once with the three-foot Smith Mixerette, hoist rig.

Bing! That bucket of concrete was sure travelling some—100 feet per minute. And it could have gone to the top of that 400 foot building just as well as to the 2nd floor.

Yes, sir, it certainly is a dandy little hoist. Listen now—a 300 lb. bucket of concrete, 400 feet into the air, at 100 feet per minute. And the best of it is that this hoist is mounted on your mixer truck **between the engine and drum** where the hoisting cable can't possibly rub or fray.

And while the hoist is handling one batch the drum is mixing another, for the engine is powerful enough to take care of both at once. Take a look into the drum. No, it won't splash. The deep, scoop-like blades keep the batch in the center where it is thoroughly mixed.

Now throw in that chute. Notice! It goes two-thirds of the way across the drum and its steep angle discharges the entire batch in 15 seconds.

Now for the third batch. You could shovel into that gated batch hopper **all day** and not get a kink in your back. Why the loading level is only 3 ft. 10½ in. above the ground.

Right this minute, before you forget it, send for Mixerette Hoist Rig Booklet No. 147-G.

Or, if you don't need the hoist and simply want a real, first class three-foot mixer, send for Mixerette Booklet No. 110-G.

The four-foot Smith Mascot Mixer has a duo-cone drum and tilting discharge

The four-foot Smith Mascot is a sure profit booster. It retains the same double cone drum and tilting discharge that earned such a wonderful reputation for the Big Smith Mixer on hundreds of famous projects.

And for a finishing touch the Mascot embodies one of the greatest ideas of the past ten years of mixer development—a dust-proof casing encircling the drum and absolutely protecting the big gear ring and driving pinion.

The above features would in themselves be enough to make the Mascot a sure winner but there are more. To get all the **Big Ideas** that make up a Smith Mascot you want to send for the catalog. Among other things it will tell you all about the rapid-fire loader that gives you maximum capacity.

This gear-driven loader has no cables, sheaves or overhead frame—there is none of that twisting, jerking motion common to the pivot type loader. On the contrary the skip lifts easily and rapidly and with its steep angle empties the batch into the drum without any loss of time or spilling of materials.

You can always depend on the all-steel Smith Mascot. It is built for fast, continuous work. It will grind out concrete from morning to night, day after day, week after week. And after five seasons use you still have a splendid machine. A little overhauling will easily put it in shape for another seasons run and after that another With good care a Smith Mascot will pay for itself many times over.

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SMITH ENGINEERING WORKS

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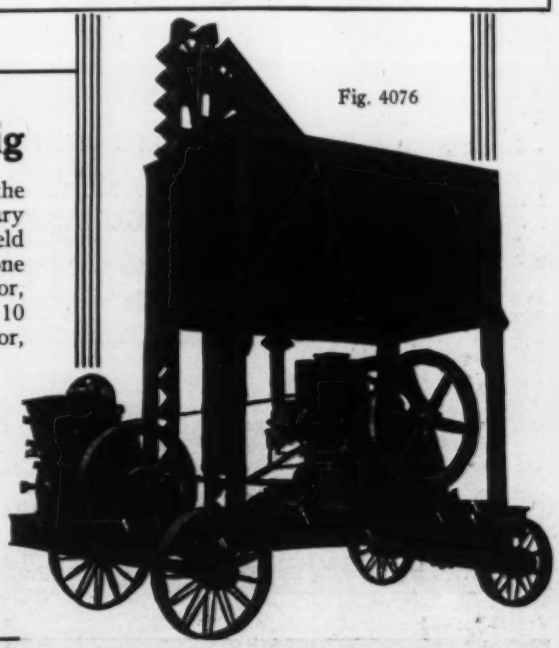

Fig. 4076

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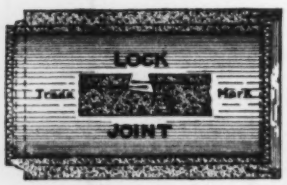

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Emerson Standard made in 6 sizes.

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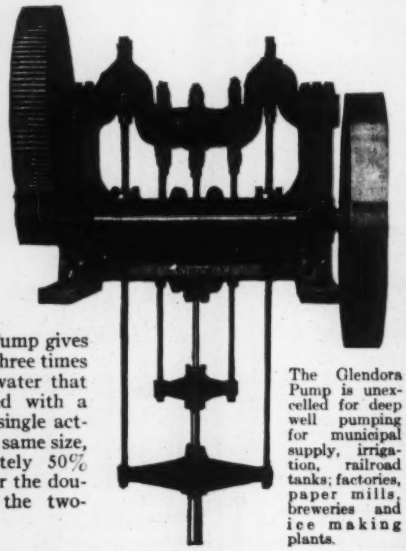

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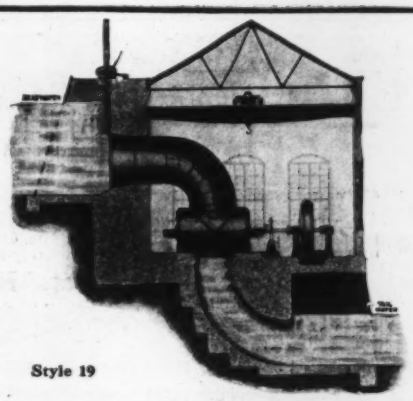

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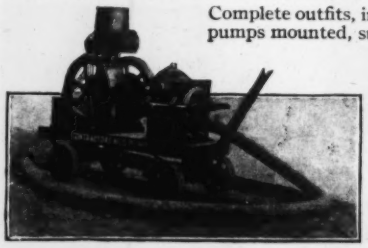

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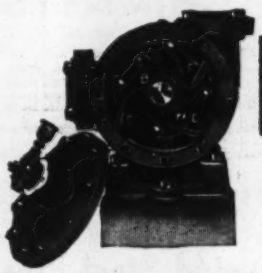

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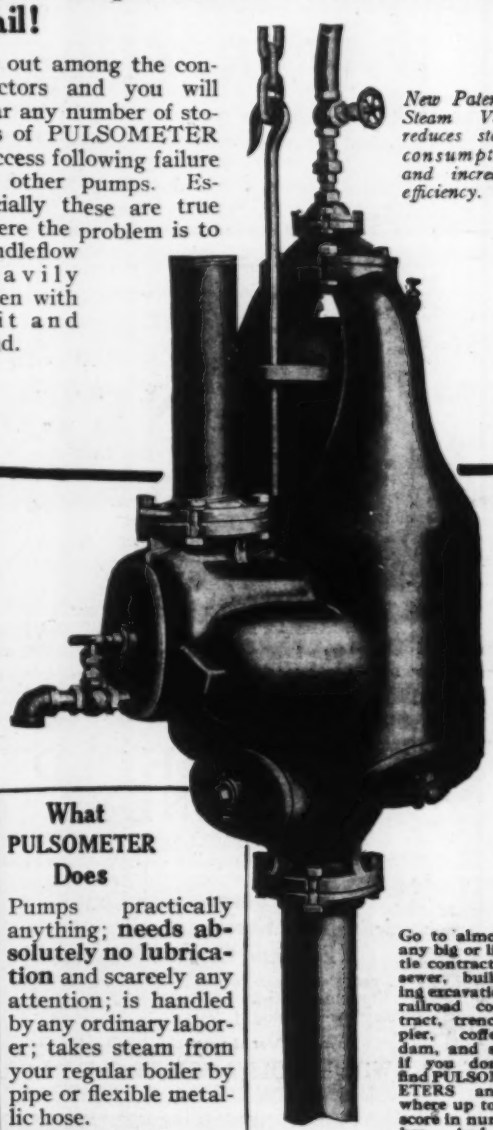

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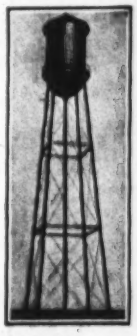

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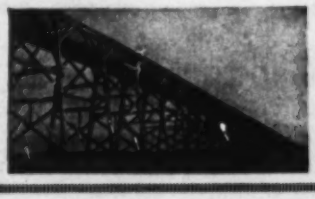

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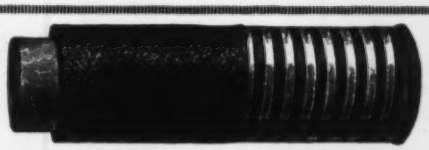

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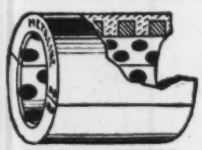

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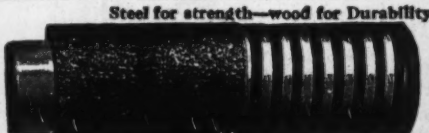

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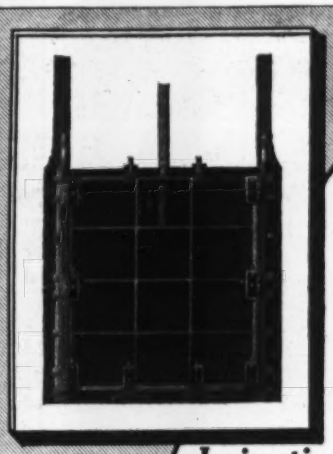

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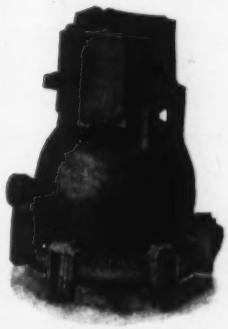

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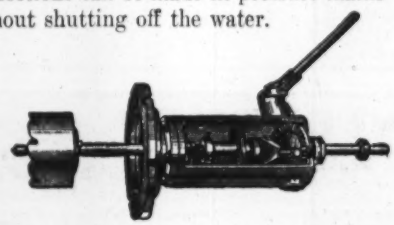

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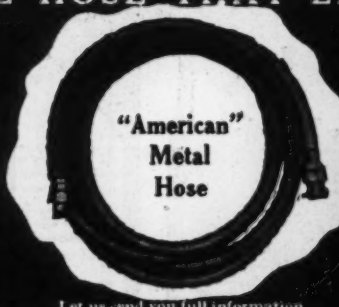

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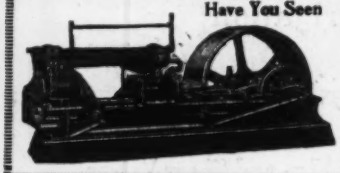

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Diamond Drill Core Borings for Foundation Testing and Mineral Prospecting
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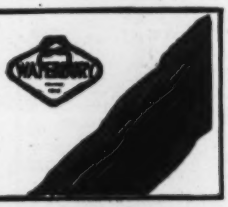

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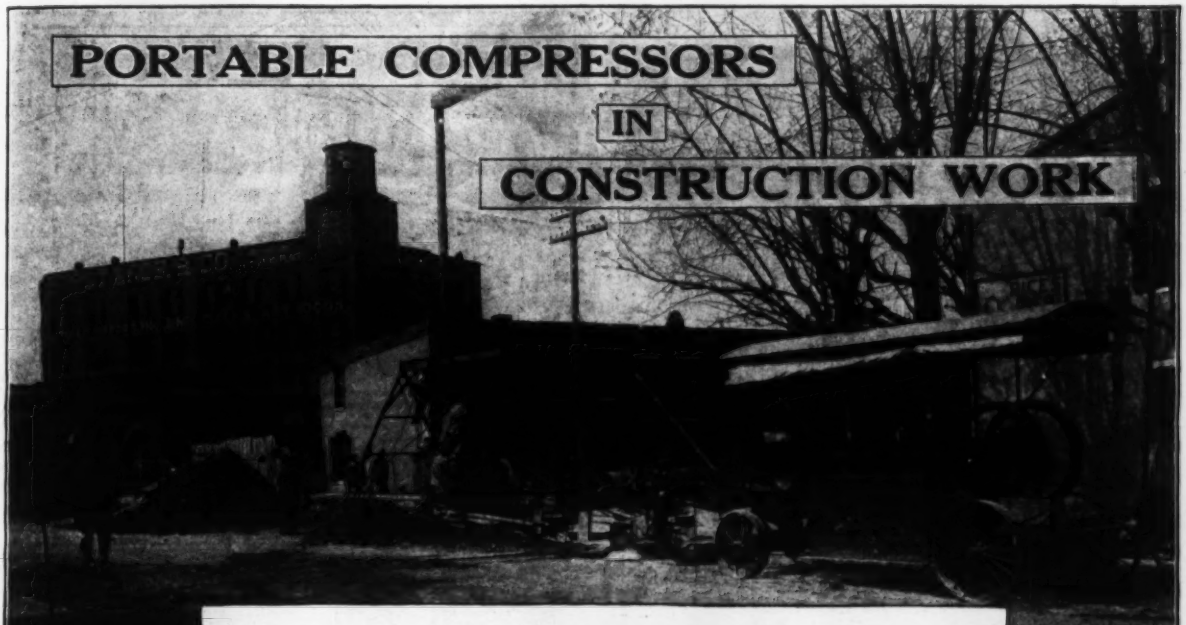
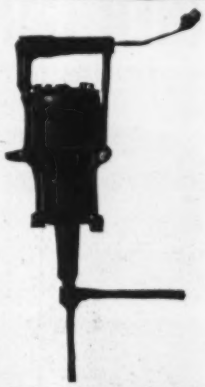


The illustration shows a class "EO-1" Oil Engine driven Portable Compressor used by the Consolidated Gas and Electric Co. of Baltimore, Md., for extending and relaying the Gas Distribution System of that city.

It is used to operate pneumatic riveters, chippers, calking hammers, pavement picks, hoists and ground tampers.

Bulletin No. 3015 describes this type of Portable Compressor and many other types as well. Send for your copy. 84-C

NEW YORK **INGERSOLL-RAND COMPANY** LONDON



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Operated from Lighting Circuit.

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for Heavy Service in elevating large quantities of water from deep artesian wells. Catalog 6.

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A Self-Rotating
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is the accepted tool for real economy. No matter what the condition of the rock may be, a **McKiernan-Terry Self-Rotating Hammer Drill** is the one for your work. Less labor, less power and less expense than with any other type of drill. It is the only drill you can afford to use for your work.

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"THE SANDWICH JOINT."

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IS THE ONLY BAR THAT CAN BE DEPENDED ON TO PERMANENTLY RETAIN ITS PLACE IN CONCRETE. THIS SUPERIORITY IS DUE TO THE SOLID ROUNDED HEAD WITH DOVE-TAILED WEB, MAKING CONTINUOUS INTEGRAL ANCHORAGE; AND GREATER WEIGHT OF RESISTING MATERIAL.

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HAS A RECORD OF SIXTEEN YEARS' USE WITHOUT A FAILURE

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The scientific, practical, efficient and economical protection for edges of concrete curbs, columns, walls, entrance posts, platforms.

Write for Highway Pamphlet, describing Curb Bars and also Armor Plates.

Trussed Concrete Steel Co. Dept. C-12 **Youngstown, Ohio**

KAHN Building Products

ENGINEERS

In writing specifications for asphalt it is important to specify requirements that will insure high grade asphalt being used. The principal and most essential requirements are high ductility, low susceptibility to extremes of temperature, low volatilization loss, and that at least 99% of all the bitumen present shall be soluble in carbon-tetrachloride.

AZTEC ASPHALT

embodies all these requisite merits, moreover it is uniform—it has the advantage of being produced by men who have had a lifetime experience and study in the production of asphalt.

Aztec asphalt IS NOT one of the minor by-products of a large oil refinery. It is a straight natural asphalt refined from Mexican Maltha, and is not a blend of odds and ends of various light asphaltic oils and semi-asphaltic oils, the residue of the distillation of products from various oil fields. Our chief business is the production of asphalt. It is our aim to produce the best asphalt possible for all purposes and results speak for themselves.

Let us send you a model form of asphalt specifications for various types of asphalt pavement.

The United States Asphalt Refining Co.
The Interocean Oil Co.

90 West Street, New York

Chicago Philadelphia Baltimore Norfolk Montreal

Prospect Street, South Orange, New Jersey. Standard Resurfacing Asphalt.

Is Your Macadam Road a Dust Bin?—Renovate It!

Have you a macadam road which motor traffic converts into a dust bin in dry weather?

There is a way to renovate that road—a way other country and rural districts are following—use our

STANDARD Resurfacing ASPHALT

and transform a disagreeable roadway into a serviceable one.

METHOD: The road should be swept clean, depression and ruts filled up, then Resurfacing Asphalt applied at the rate of one-half gallon per square yard. Then cover with sand or stone screenings and roll thoroughly.

Standard Resurfacing Asphalt, like all our other grades of binders and paving asphalts is refined directly from MEXICAN asphaltic petroleum, and does not contain any slippery lubricating element. It builds up on the top of the road metal a firm, resilient, dustless, durable "traffic mat."

Others are doing this and making good roads out of bad at small cost. Why shouldn't you? Write for fuller details.

Standard Oil Company
(New Jersey)

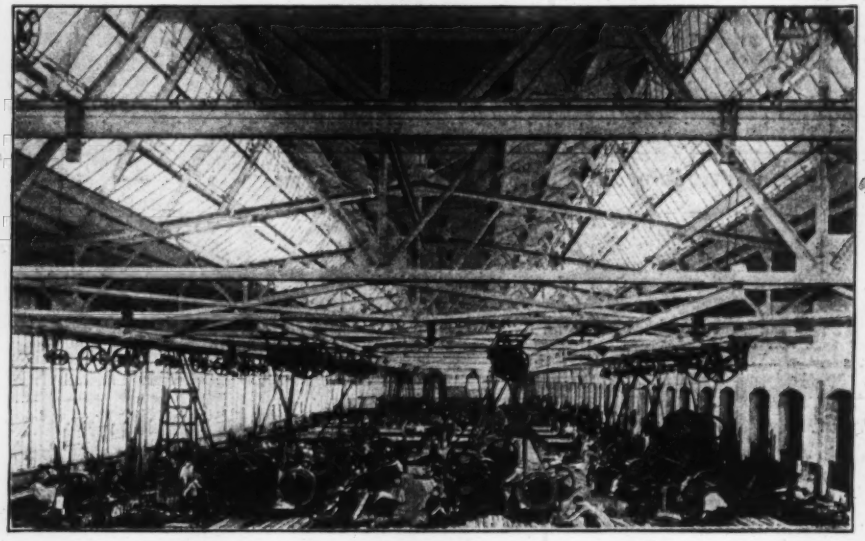
Newark Baltimore

Geo. W. Lamson, Agent, Railway Exchange, Chicago, Ill.
J. S. Helm, Agent, Healy Bldg., Atlanta, Ga.

American Machinist Says:

"The Psychological Effect of Good Light in the Shop is to Give a Feeling of Security and Cheerfulness."

Good Light Is Essential to a Good Product



Perfect Light is Provided by Lupton Products

Every Engineer Can Promote Production by Careful Provision for Maximum Daylighting and Natural Ventilation

THE LUPTON SERVICE DEPARTMENT can help you make **careful provision** because it has had years of experience in solving problems of daylighting and natural ventilation. It has investigated the needs of a wide range of industries. It is maintained for the exclusive purpose of assisting clients, prospective builders, architects, contractors and engineers with all problems pertaining to daylighting and natural ventilation. The same careful attention will be given to small buildings as to the large. Lupton Products have been designed to meet the varied requirements of industrial buildings. They include Lupton Steel Sash for side-walls; Pond Continuous Sash for Roof Lighting, Pond Truss, Foundry and Forge Shop Type, Pond Operating Device, Lupton Steel Partitions, and Tube Steel Doors, etc.

The latest Lupton Book contains the result of years of experience and describes our production promoting products. Want a copy? We must have your name and address to send it and the coupon is designed to save your time. Just fill it in and we will send the book.

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A large number of buildings daylighted and ventilated by Lupton Products are described and illustrated in the latest Lupton Book. Get **your copy.**

David Lupton's Sons Company

Tulip and Westmoreland Streets, Philadelphia, Pa.

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It is important to know what you get for your money when buying a locomotive.

The designing must be done with the utmost care to insure correct proportion and sufficient strength of every part. The right amount of the right material must be provided in the right place, and every part must fit every other locomotive of the same size and design to avoid days of idleness at critical times of the work.

Our locomotives for industrial service are designed and built for maximum work and long life.

SEE OUR EXHIBIT IN TRANSPORTATION PALACE, PANAMA-PACIFIC EXPOSITION, SAN FRANCISCO, CALIFORNIA.

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N. B. Livermore & Company, Los Angeles and San Francisco, California.

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LIGHT LOCOMOTIVES

You cannot find their equal for strength, power, quality, weight and durability. They are a good investment, guaranteed in every particular and made in every variety of size and design, for any gauge of track.

Go over the question of Locomotives with us. Write for prices. Porter Locomotives are distinctive in quality and efficiency.

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NEW YORK OFFICES—Hudson Terminal Bldg.

PLYMOUTH
Gasoline Locomotives

In operating **Plymouth Gasoline Locomotives** you provide fuel only as long as the engine is in action. No boilers to be bothered with, no waiting for steam, no fear of chemically-unfit water.

Plymouth Gasoline Locomotives are always ready when called upon. They will reduce your haulage cost per ton mile.

Get the facts. Do not delay. Send NOW for Catalog.

The J. D. Fate Company

Plymouth, Ohio, U. S. A.

You Can Crush to Suit Your Trade

with a JEFFREY TYPE A STONE PULVERIZER

The Fine product of this machine is ideally suited for **ROAD TOP DRESSING or FILLER.** It satisfies the Road Inspector's Demands and insures a constant supply of Screenings at less cost than you can buy them.

It gives excellent service in the making of **Stone for Concrete.**
From the Fines and Dust are being made **Roofing, Fluxing and Finishing Stone—Agricultural Fertilizer**—that means Increased Crops and Profits.

Every Road Contractor should have a copy of Bulletin No. 142-23 telling all about this machine. Request it—NOW.

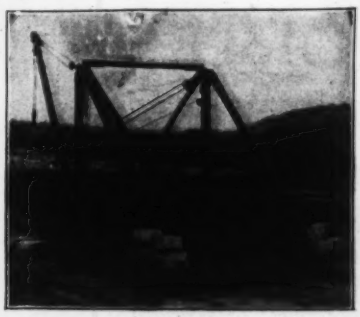
JEFFREY MFG. CO., 923 North Fourth St., Columbus, Ohio
New York Boston Philadelphia Charlestown, W. Va. Birmingham Chicago Denver Montreal

6-24-15.

INSLEY METHOD
Concrete Distribution

The efficiency of the Insley Plant throughout represents years of specialized development.

INSLEY MFG. COMPANY
Engineers and Manufacturers
INDIANAPOLIS, INDIANA



Flory Hoists do the work on the traveling derricks at Kensico Dam.

Contractors

Flory Efficient Hoists

Each of these eight travelers are equipped with
2—75 H. P. two-speed "patented" Derrick hoists—
2—11 H. P. Boom swingers, all Electrically operated.

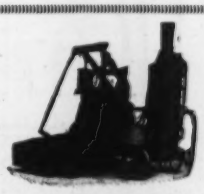
S. Flory Mfg. Co.
Bangor, Pa.

Schaefer Direct-Connected Mixers

mean longer life and fewer repairs—faster work and larger profits. Every machine built as a unit—engine especially designed to fit the mixer it is to drive and direct connected to the drum requiring only one chain with a self-adjusting friction clutch.

Built in 5, 8, 11, 12, 15, 22, 30, and 40 cu. ft. capacities, with both steam and gasoline power.

Schaefer Mfg. Co., 50 Pearl Street, Berlin, Wis.

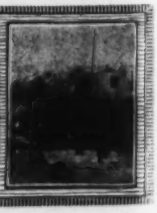


THEW SHOVELS

are economical in almost any class of excavating. The Thew handles either a 6-inch or a 40-foot cut economically and will handle anything from sand to blasted rock.

1200 Thews are in operation today. Write for Catalog "I" and List of Thew Owners.

THE THEW AUTOMATIC SHOVEL CO. LORAIN, OHIO



What is Your Concrete Costing You?

It Costs 2 cents Per Yard to Operate an Automatic Concrete Mixer

Automatic Concrete Mixer

and Requires No Power

100 cu.yds. a day from a ¼ yard mixer.

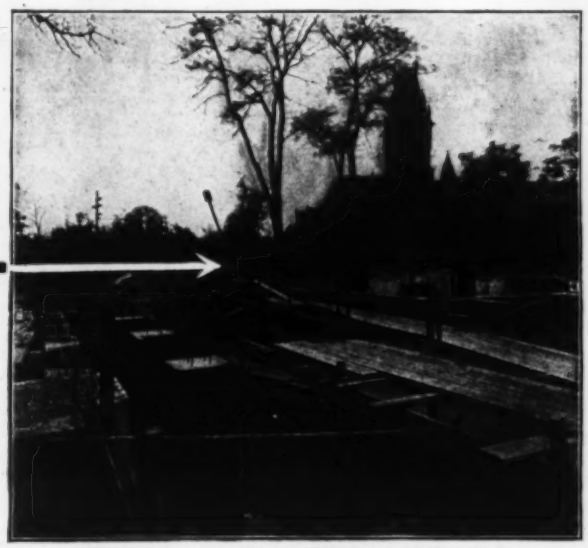
1000 cu.yds. a day from a 1 yard mixer.

Millions of yards mixed and Millions of dollars saved by the Hains-Weaver Patents.

MADE IN ALL SIZES

¼ yard Batch to 2½ yard Capacity.

You should have our New Catalogue. It's full of facts!



Germania Museum.—Harvard University, Cambridge, Mass.
Architects, Warren & Smith. Contractors, W. A. & H. A. Root Co.
One-bag mixer hung from grade. Concrete was handled by barrows wheeled to forms.

An officer of the above firm wrote to a prospective customer of our's as follows:—

"The operation of this mixer is simply gravity, doing away with hand labor or power, which is a great saving, but the most important thing to us is, after this mixer is properly set us as directed by the manufacturers, a concrete is produced, which in our opinion is the most perfect mixture obtainable by any method whatsoever."

Automatic Concrete Mixer Company, Inc. 428 Kinsley Ave. Providence, Rhode Island

Foote Concrete Mixers

For twenty years FOOTE mixers have been giving satisfaction on all classes of building and paving work. They are made in many different sizes and with special equipment for unusual jobs. Send for the Foote Catalogue.

Address the Nearest Agent

Foote Concrete Machinery Co., 108 So. LaSalle St., **Chicago, Ill.**
Wilcox Bros., Inc., 26 Roosevelt Ave., **Binghamton, N. Y.**
E. J. McHarg & Co., 3 Crandall St., **Binghamton, N. Y.**
W. C. McAulis, Imperial Hotel, **Detroit, Mich.**
C. W. Klapproth, 30 Church St., **New York, N. Y.**
Edward R. Bacon Co., 51 Minna St., **San Francisco, Cal.**
Hallidie Machinery Co., 122 King St., **Seattle, Wash.**
Hodson-Feenaughty Co., 309 East Yamhill St., **Portland, Ore.**

(Made by Foote Mfg. Co., Nunda, N. Y.)

The AUSTIN PAVER with Multi-Pedal Traction.

SAVE TIME!

Your profits from paving work will depend more upon your method of employing this valuable element than upon any other factor.

Consider the possible saving of five seconds on each half-yard batch in a ten-hour run. It means an additional 100 square yards of six-inch pavement for the day. Figured at $1.25 per square yard, the contractor gains $125 in his estimate for the day.

Now, these valuable five seconds are saved by the

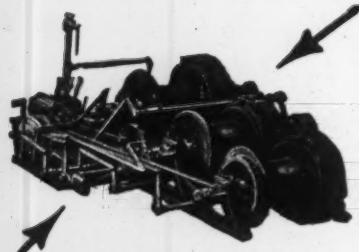
Austin Cube Paver

because the bucket holds the entire batch. Another five seconds are saved by the rapid operation of the wide-loading skip.

Besides these features, the Austin Paver has the cube principle of mixing, which insures thoroughness and speed, and the blue annealed high-carbon steel drum, which is typical of its durability and wearing qualities.

Write for Road Mixer Booklet No. 2.

Municipal Engineering & Contracting Company
Main Office, Railway Exchange, Chicago
New York City, 30 Church St. San Francisco, 473-485 Sixth St.
Agents wanted in open territory.



MEAD-MORRISON
MANUFACTURING COMPANY
Specialists in Machinery for Successfully
Handling Coal, Ore or Sand

MEAD-MORRISON MANUFACTURING CO.
126 Prescott St. East Boston, Mass.
Gentlemen:—Please send your catalogs.
Name.....
Address.....

LET US CO-OPERATE WITH YOU.

OUR ENGINEERS ARE AT YOUR SERVICE.

42 Yds. Unloaded in 1 Hour at 2½ Cts a Yd.

This One Man Does the Work of Ten Shovelers

Let him work for you

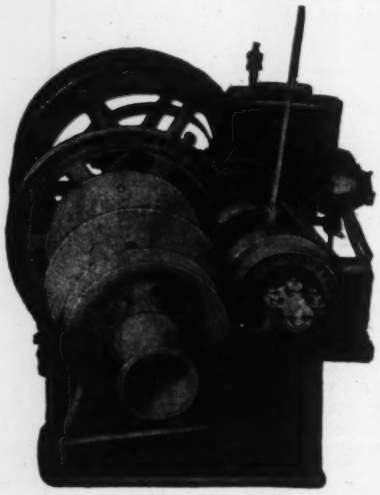
He is the operator of the Eclipse Portable Unloader—any unskilled man can be an operator. Besides the cost of 10 shovelers you can save team time—30 minutes on every load—by using to unload railroad cars to wagons or trucks the

ECLIPSE PORTABLE UNLOADER

It unloads five or more fifty-ton cars per eight-hour day, from wagons to trucks, for $5. It will do it for you. Make us prove it. **Write now.**

The Galion Iron Works & Mfg. Co., 107 East Main Street, Galion, Ohio, U. S. A.

Yes Sir, It's "O. K."



O. K.
Reversible Builders' Hoist

Designed and built to meet the requirements of the modern building contractor. Unsurpassed in efficiency, reliability and durability. Very heavily built, with extra long bearings. The two friction clutches are provided with renewable asbestos linings that are oil and water proof. All control levers are within convenient reach of the operator. The differential brake is fitted with a ratchet and pawl. **Write us today for our latest Bulletin.**

O. K. Clutch & Machinery Co., Columbia, Penns.

A Safety Block with a Safety Lock

Note that with this block the load can't become detached accidentally. Load cannot be released till lock is pulled back by hand. A great protector of life and limb.

It's one of the things described in our new Catalog No. 18. Let us send you a copy NOW.

Dobbie Foundry & Machine Co.
Niagara Falls, N. Y.
Branch Stores: Pittsburgh and New York
C. T. Patterson & Co., New Orleans, La. Geo. B. Carpenter & Co., Chicago.

There Are—
BROWNING
Locomotive Cranes
On The Interesting Jobs
Sales Offices:
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Chicago San Francisco
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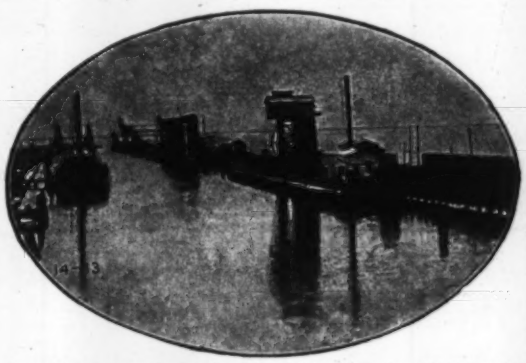

Docking Canal—Fort Tampa, Florida. Atlantic Coast Line R.R. Terminals

TWO phosphate rock elevators and coal handling bridge equipped with Hunt Machinery.

Three large *consecutive* orders from one careful buyer argues well for the service given by our machinery under the severest kind of operating conditions.

Cutting the cost of handling material has been our specialty for 40 years. Tell us *your* problem, and let us show you how our "Labor Savers" can help *your dividends.*

C. W. HUNT CO., Inc.

West New Brighton, N. Y., U. S. A.

61 Broadway, New York City. Fisher Bldg., Chicago
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The Panama-Pacific International Exposition Company Chose from All Cranes the "Ohio"

to unload, handle and place all heavy exhibits and decorations.

Illustration shows the OHIO engaged in unloading Palm Trees weighing from 5 to 17 tons each, several hundred being distributed about the Exposition grounds.

Write for catalogue No. 5.

The Ohio Locomotive Crane Company

Mansfield St., Bucyrus, Ohio

30 Church St., New York
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Industrial Engineering & Machy. Co Montreal
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A 25-Ton Industrial Works Crane at Miraflores Locks—Panama Canal

AT PANAMA

85% of all permanent structural steel work on the Panama Canal was handled by Industrial Works Cranes.

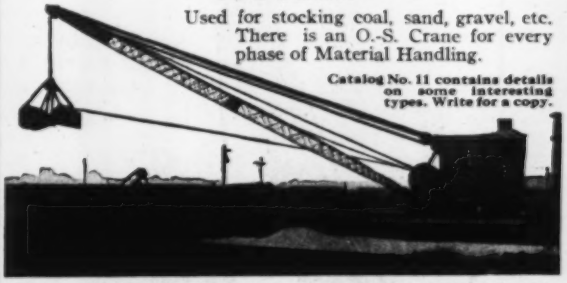
Find out why. Ask for Catalog 108.

Industrial Works, Bay City, Mich.

O.-S. 20-Ton Radial Truck Crane for Profitable Yard Service

Used for stocking coal, sand, gravel, etc. There is an O.-S. Crane for every phase of Material Handling.

Catalog No. 11 contains details on some interesting types. Write for a copy.



Orton & Steinbrenner Co., Main Office: CHICAGO, ILL. Works: Huntington, Ind.

LINK-BELT CRANES

For Dependable Service

A Link-Belt Crane is an all-around machine for general work around any plant. It may be arranged to handle hook block, self-filling grab bucket, drag line bucket, electric lifting magnet, or equipped with special boom for steam shovel attachment and pile driver.

LINK-BELT COMPANY
PHILADELPHIA, CHICAGO
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Traveling Cranes

For Power-House and every service. Electric and hand-power. Clearance diagrams and other information for initial layouts gladly furnished to engineers on request. Send for catalog.

We make Tainter Gate Hoists

Complete Foundry Plants

WHITING
FOUNDRY EQUIPMENT CO
HARVEY, ILL. U.S.A.

Cranes of All Kinds

HAYWARD CLAM SHELL BUCKETS

THE Hayward Class "E" Clam Shell Bucket is a most efficient machine for digging such materials as crushed stone, broken slag, gravel, packed sand, etc., and may be equipped with steel teeth for excavating in hard or rock filled soil.

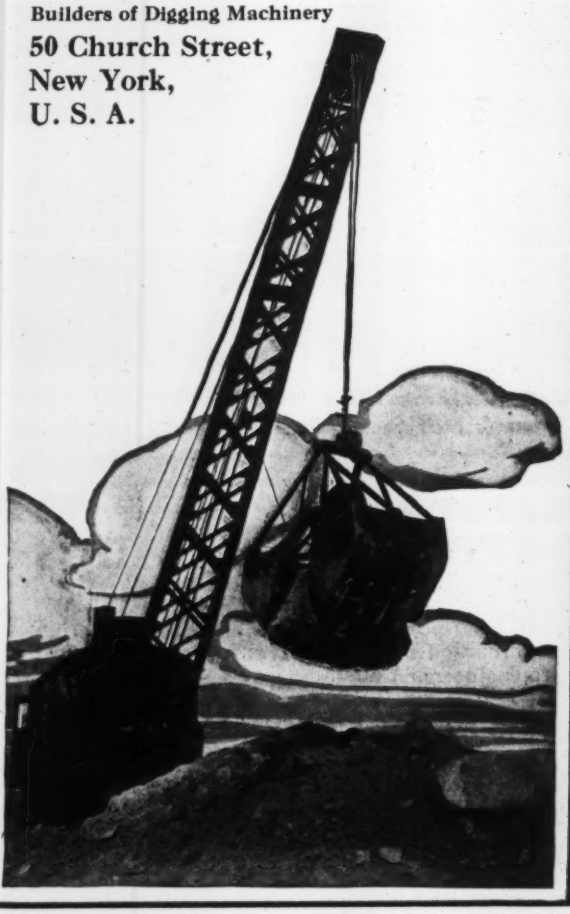
The illustration below is one of four machines used for changing the grade on the Long Island Railroad, East New York The Bucket is a Hayward Class "E" with Ore Bowl equipped with teeth. This type of bucket is particularly serviceable when the material to be dug contains a large percentage of gravel or boulders.

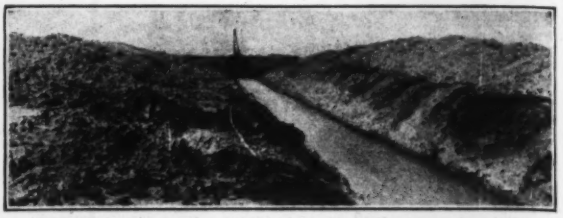
There are Hayward Buckets for digging and rehandling under all conditions. Tell us your particular problem and we will make recommendations and send you catalogues.

THE HAYWARD CO.

Builders of Digging Machinery

50 Church Street,
New York,
U. S. A.





It Walks to Work and Wades Right Through It

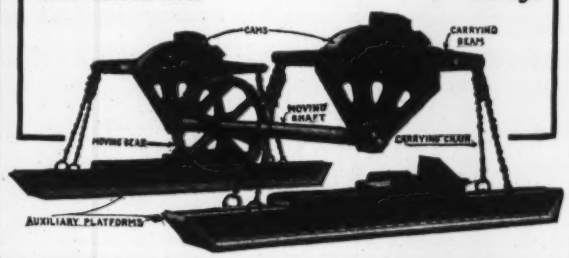
The Walking Traction of the Monighan Drag Line Excavator

Has effected savings of 25 to 50% in the cost of excavation by the ease and rapidity of handling it gives to the machine.

We are in a position to show you the machines that have made these records and to fully substantiate the records. The simple device shown below walks the machine to work over any soft ground—moves it to a new setting in 30 seconds and makes possible the use of a shorter boom and bigger bucket.

Just watch one machine on the job—we'll tell you the nearest.

Monighan Machine Company
2036 Carroll Ave. Chicago



Hydraulic Dredges?

We build them. One by us at Panama has pumped coral, sand and rock through 7200 ft. of pipe without relay. Dredges like that mean profit to you. **Write us today for details.**

Ellicott Machine Corporation
Baltimore Maryland

Builders of Hydraulic Dredges, Steel Vessels, Lighters and Car Floats. Spare parts always on hand for immediate shipments.

TRENCH MACHINES

We sell and lease All Kinds of Hoisting and Conveying Machines for Trench Work.

Catalog Sent Upon Request.

Carson Trench Machine Co., Boston, Mass.

BRANCH OFFICES: Rose Bldg., Cleveland; 348 James St., Montreal.

Parsons Trench Excavators

for excavating

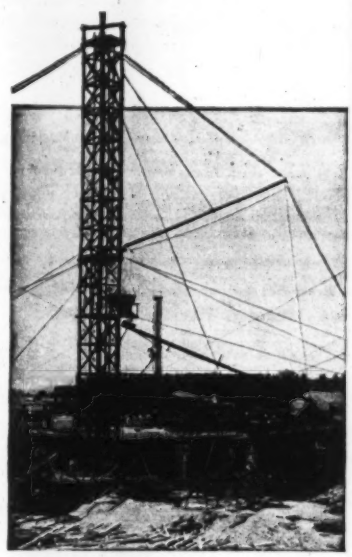
Sewer, Water and Gas Main Trenches

Send for our latest Catalog

The Parsons Company, Newton, Iowa

YELLOW STRAND

Power Steel Wire Rope Helps Build the New Mass. Institute of Technology



One of the Concrete Towers Equipped with Yellow Strand Powersteel for Hoisting.

These new buildings will cover a site of 50 acres—their total area will be close to 90,000 square feet. Stone & Webster are the contractors handling hundreds of workmen with the system of a 1915 army. This job is made to spell Efficiency with a big capital "E."

Up to November 9th we had delivered to this job 12,000 feet of Yellow Strand Powersteel of various sizes. More will follow as the work progresses. Strength, flexibility, "life," dependability, was what the buyrs were looking for and demanded. They selected Yellow Strand! Enough said.

Catalog 64 on request.

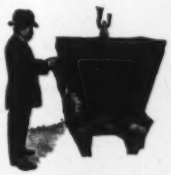
Broderick & Bascom Rope Co.

New York ST. LOUIS Seattle

Factories: ST. LOUIS and SEATTLE

Why Not Get in Line With the Leaders?

Leading contractors have saved money in excavating, concrete and general hoisting costs by using



Controllable Bottom Dump Bucket (Patented)

"Excelsior" Bottom Dump Concrete Bucket (Patented)

STUEBNER

Hoisting Buckets

Unexcelled in a single detail. Leaders in efficiency and durability.

Our full line includes Coal Hoisting, Mining, Excavating and Bottom Discharge Buckets—Steel Skips—Side and End Tip, Rotary Dump, Drop Bottom and Boiler Room Cars—Asphalt, Tar and Lead Melters, Hand Dump Carts, etc., etc.

Catalog "N" is yours on request. Write.

Self-Dumping and Self-Righting Turnover Bucket

"Invincible" Bottom Dump Bucket (Patented)

G. L. Stuebner Iron Works **West 11th St., Long Island City New York, N. Y.**

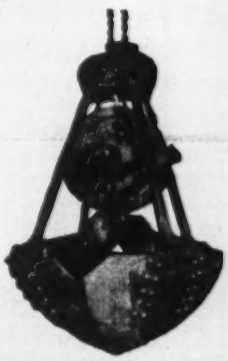
Single Closing Sheave Orange Peel Dredging and Excavating Bucket

The construction of this bucket is most substantial, being made of homogeneous steel plate of 60,000 pounds tensile strain. Bearings are steel bushed, removable and easily replaced.

The four blades which form the main body of bucket are made extra heavy, with the points reinforced and welded, insuring well-hardened points for penetration.

The lower casting on crosshead is made of cast steel, and likewise the top casting which receives the arms. The arms are made of heavy forged iron and steel bushed.

All sizes in stock for immediate shipment. We build buckets of all types.



Theo. Smith & Sons Company

Jersey City, N. J. U. S. A.

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BRIDGE TIMBERS
TELEGRAPH POLES
PILING, ETC.

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INTERNATIONAL CREOSOTING & CONSTRUCTION COMPANY
Address all Communications to Office
WORKS { BEAUMONT, TEX. / TEXARKANA, TEX. GALVESTON, TEX.

CREOSOTED
Wood Block Paving Bridge Timbers
Ties, Poles, Piling, Cross-Arms, Conduit.
Also Ties Treated with Zinc Chloride.
Pittsburgh Wood Preserving Co. The Ohio Wood Preserving Co.
Michigan Wood Preserving Co.
OFFICE: Commonwealth Building, Pittsburgh, Pa.
PLANTS: Pittsburgh, Penna. Orrville, Ohio, Reed City, Mich.

WHY *Avenarius* CARBOLINEUM REGISTERED PRESERVES WOOD EVERYWHERE
Simple methods—known costs—explained in new special circular—get it. Avenarius Cabolineum prevents decay of wood. Doubles life of timber. Costs 1/2 to 2c. per. sq. ft.—$5 to $12 per 1000 ft. B. M. Applied by brush, spray or open tank. 37 years' continuous service. Depots everywhere.
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WHITE OAK and YELLOW PINE
Timber Piling Cross Ties
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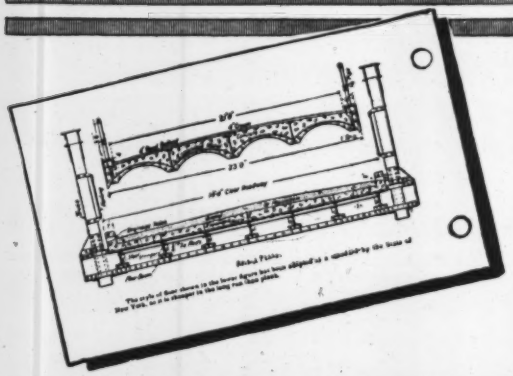

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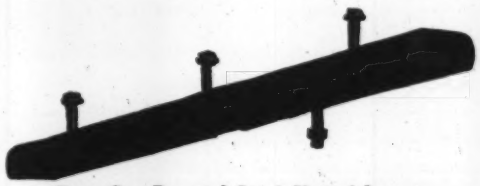

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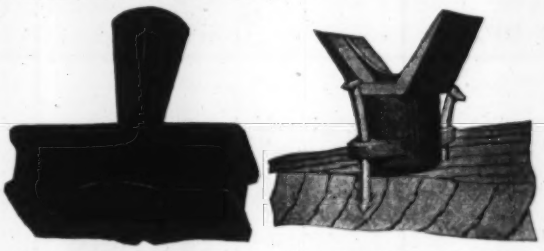

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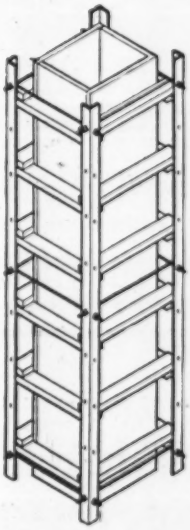

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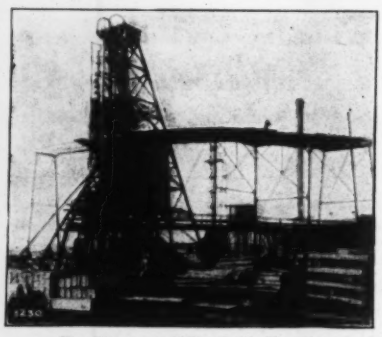

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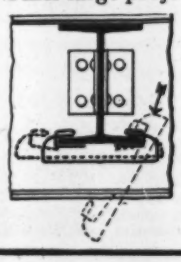

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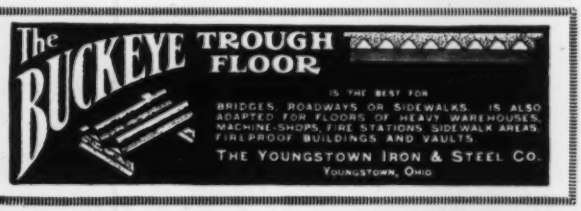
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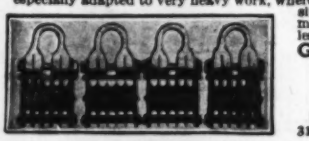

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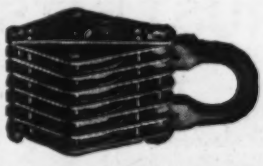

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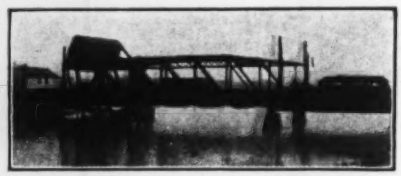

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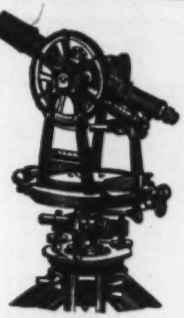

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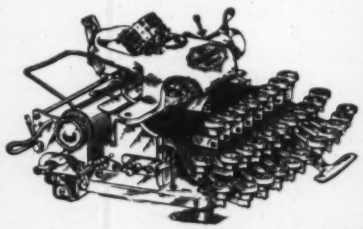

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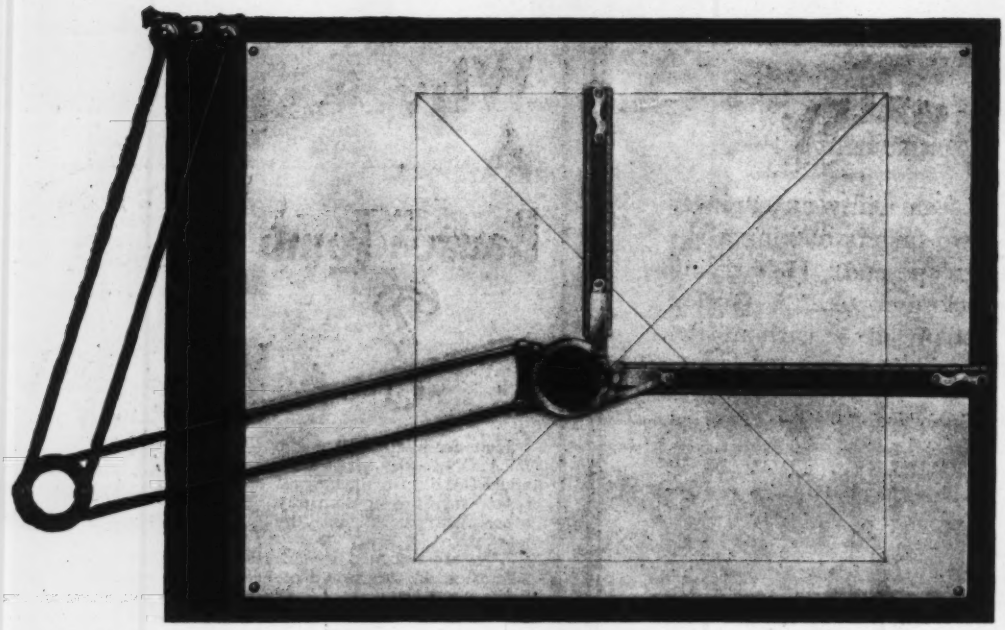

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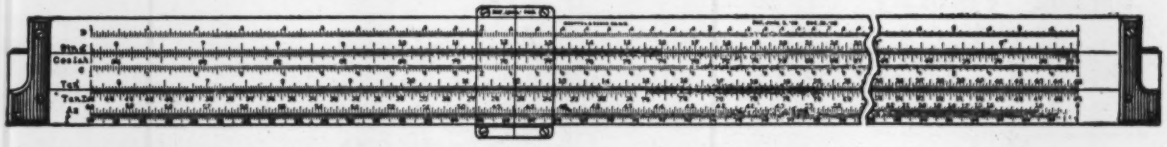

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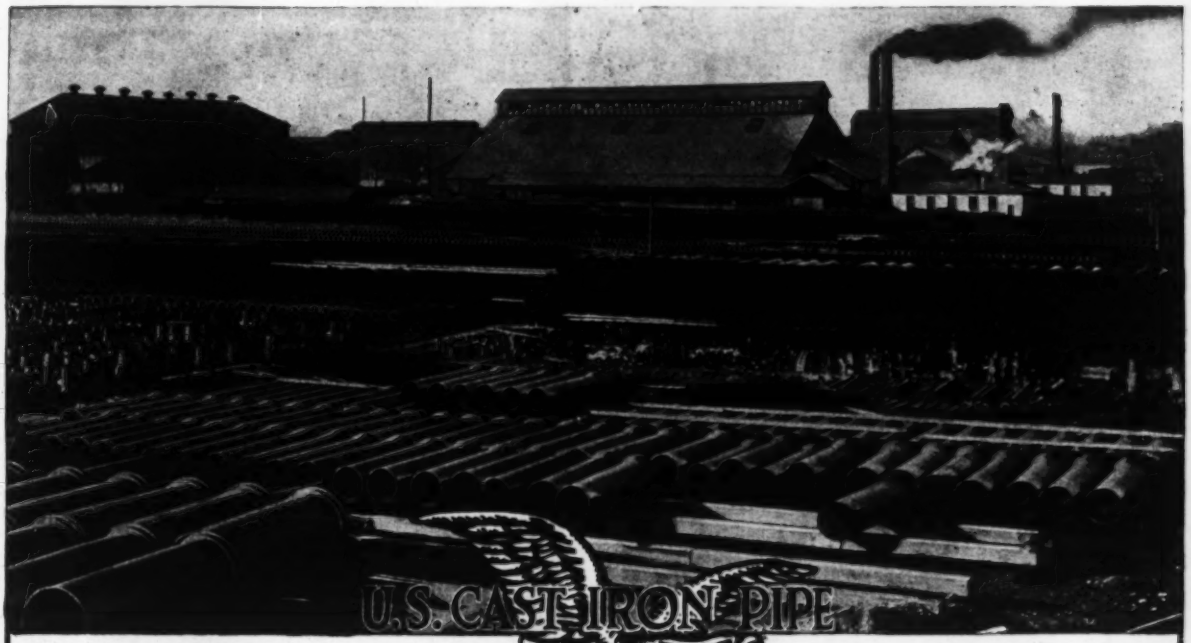

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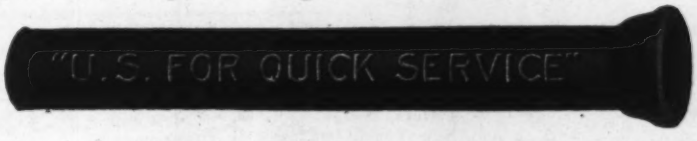

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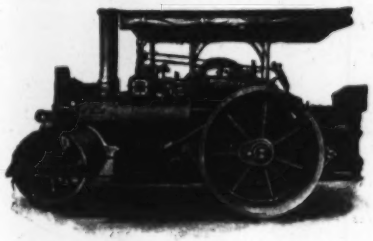

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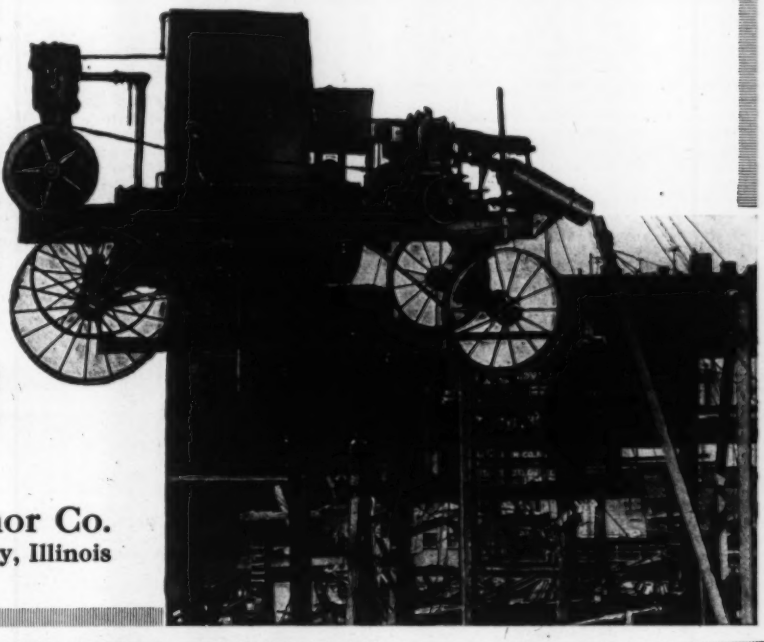

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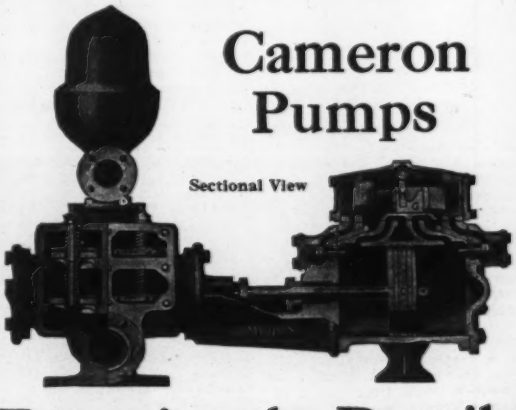

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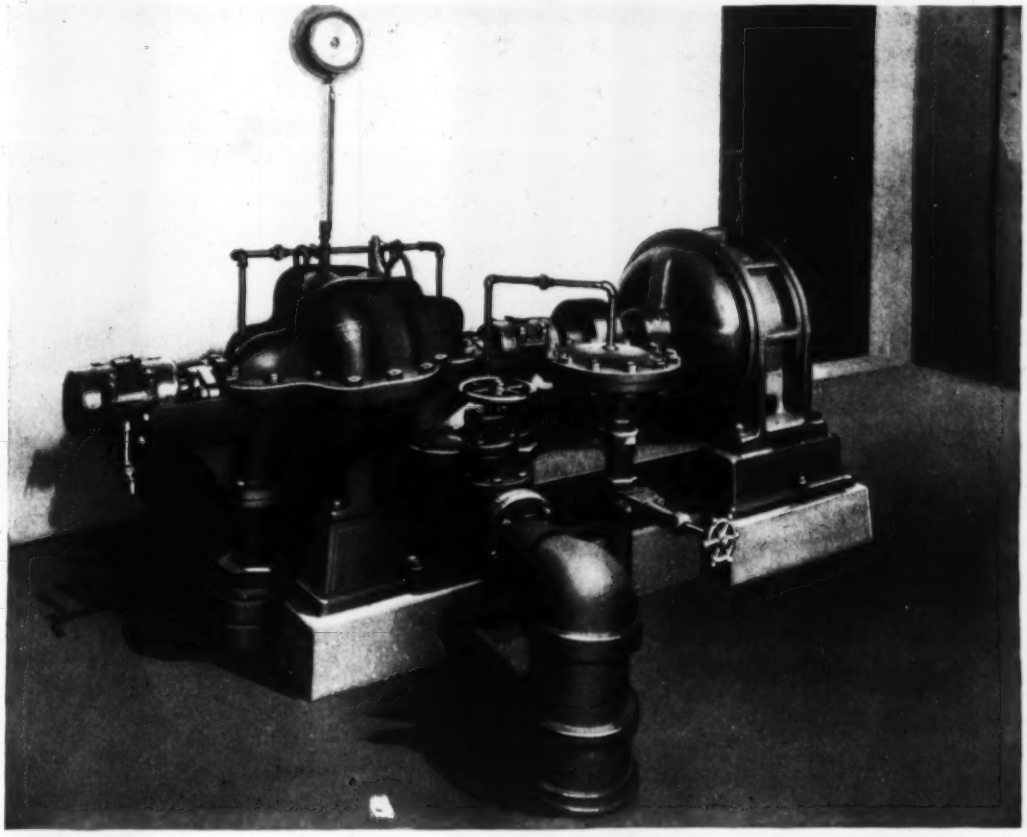

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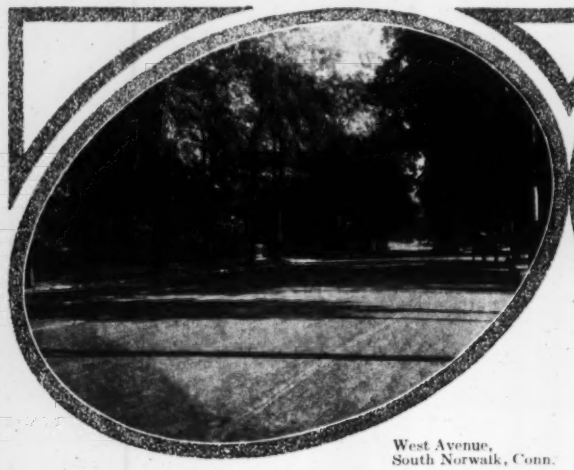

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